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PLASTICS

A Periodical Devoted to the Manufacture and Use of Composition Products

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PARTS formerly made of metal, or other material, often possessed faults that have since been obviated by molding them of Bakelite. Steel, pressed and enameled, was used for the dental-chair arm shown here, but it was cold to the touch and the enamel was easily chipped. Now it is molded of mahogany red Bakelite in a single operation, with metal inserts solidly embedded. Its color and finish are durable, it will not chip, and it is comfortable to the touch.

The strength and hardness of molded Bakelite have made it ideal for furniture rests or casters. The round, flat rest shown above sustained a compression test of 8,385 pounds. The two rather intricate Bakelite parts pictured at the right are from a heat control of a gas range. The utmost accuracy is essential, as the two must fit snugly together.

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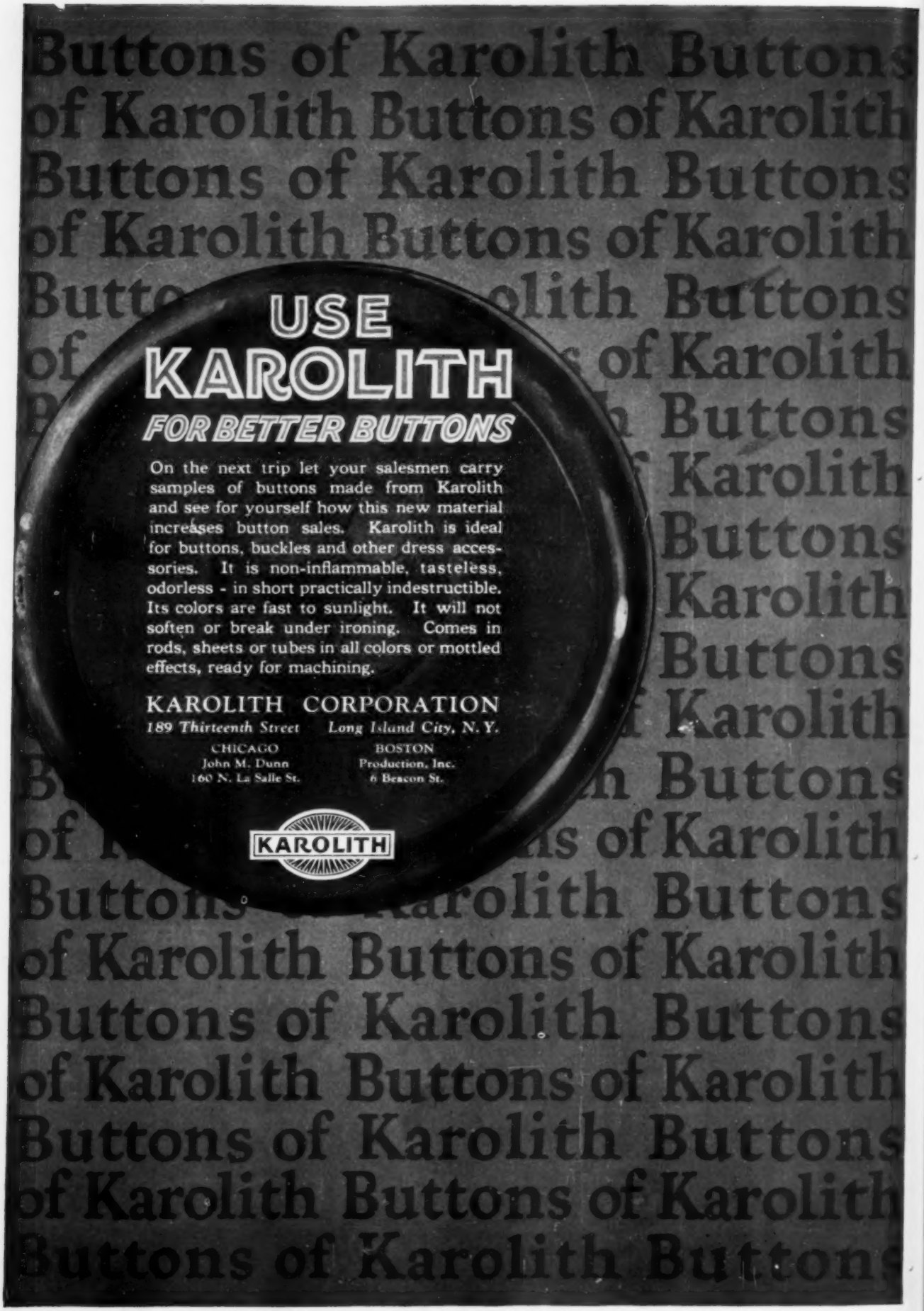
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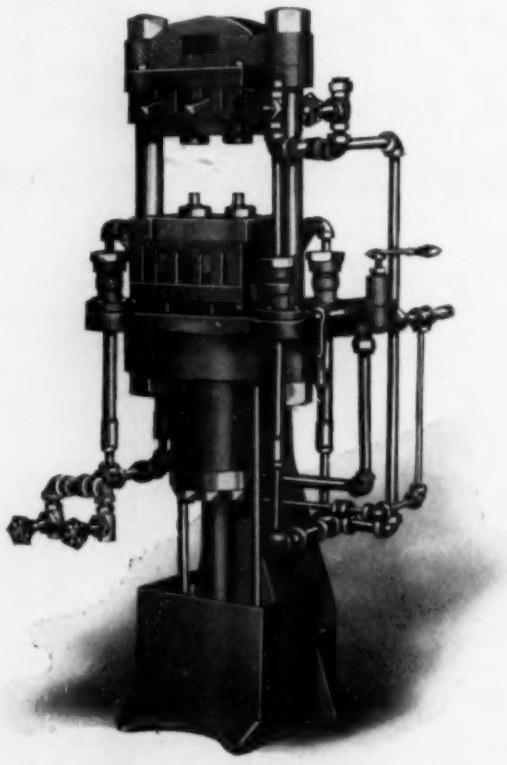

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THE prize contest for new uses for plastic material brought out one very interesting fact, that very few men in or out of the industry know the possibilities of many of these materials.

Of the numerous suggestions contributed, few limited themselves to any particular plastic material, and have simply used the term "plastics" without giving any suggestions as to what they meant thereby, or what particular material was used.

Another remarkable thing, from our point of view, is that none of the suggestions sent in were actually new, and nearly all of them were commonplace and old. This goes to show that authoritative information is limited, apparently, to a few people in the trade who obviously did not enter the contest.

TO fill a concerted demand and long felt want, the first annual

DIRECTORY, INDEX & BUYERS GUIDE

of the Plastics Industry will be issued in December.

This Annual Directory will be divided into four main sections:

Alphabetical list of manufacturers.

Classification of products.

Classification of trademarks.

Cross index of 1924-25 'Plastics' Editorial Content.

It will have a large distribution amongst all buyers, and fabricators of Pyroxylin, Casein, Bakelite, Shellac and allied products.

To make it as complete as possible, every possible manufacturer and his products will be listed. There will be no charge for as many listings as required as it is our purpose to make the Directory as helpful and as thorough as an extensive and special staff can make it.

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THE PUBLISHERS.

PLASTICS

A periodical devoted to the manufacture and use of plastic and composition products

Vol. 2 September, 1926 No. 9

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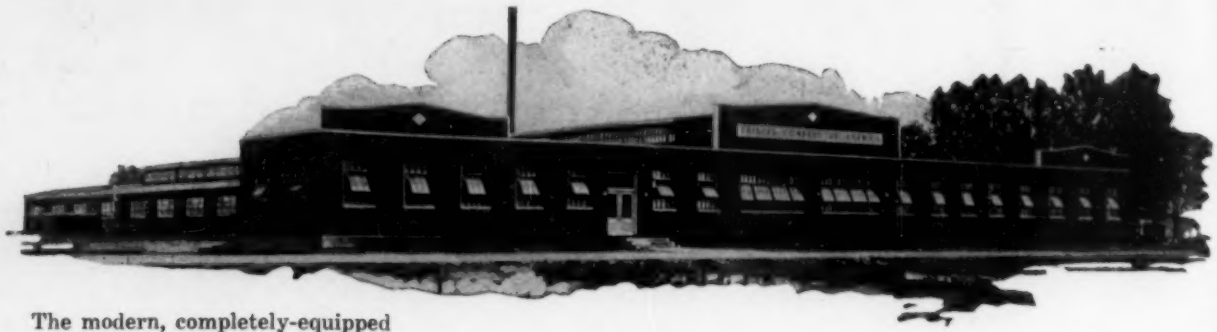

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PLASTICS

A periodical devoted to the manufacture and use of plastic and composition products

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Vol. 2 SEPTEMBER, 1926 No. 9

Shaw Plant Features Efficiency

Proper arrangement of machinery and conveyor belts speed up production

By Carl Marx

NEWARK, N. J., which boasts of being the home of a greater number of **different** industries than any other city, has a rapidly growing suburb known as Irvington. In fact, the dividing line between the two cities has been obliterated, so that the casual visitor never knows whether he is in Newark or Irvington.

Irvington, however, although an industrial center, does not present the usual smoke and dust-laden atmosphere so common with manufacturing towns. Not far from the point known as Irvington Center, on Coit street, stand a number of well built, commodious and "day-light" manufacturing plants. The large number of modern dwellings within walking distance of this district make it an ideal labor market, especially for skilled help of the better kind.

In the heart of this region stands the modern, spacious plant of one of the foremost molders of plastics in the United States. Devoted exclusively to the molding of thermoplastic materials, and engaged in custom work for the largest electrical and radio manufacturing concerns in the country, this plant is a model of its kind.

The Shaw Insulator Co., to which the above refers, is the outgrowth of the comparatively small plant built in 1892 by Mr. Henry M. Shaw, President of the company. Its first business was the manufacture of lightning arresters for telephone work, and insulators for overhead trolley and third rail equipment. As Mr. Henry Shaw was already the third generation in the molding of plastic materials, a pursuit which had been in the family ever since any kind of molding originated, it naturally followed that the business would expand along such lines.

Plenty af light, roomy and well-ventilated work-rooms, all help to produce operating conditions that increase the output and to make operators contented.

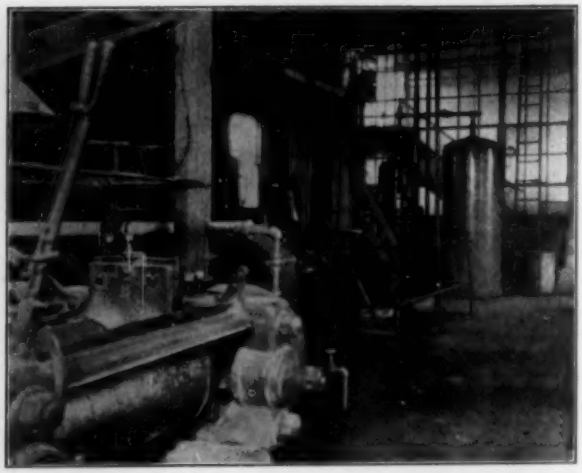
The main plant of this company is housed in a brick and concrete building, with practically all-glass sides, affording excellent light and ventilation. The lower floors contain all the heavy molding machinery, as well as the malaxating rolls, mixers and blenders used for the compositing of the plastic materials. A good part of the molding is done with synthetic resins, such as Bakelite, and is obtained already mixed, ready for molding.

There are upwards of fifty hydraulic presses, varying in size, and the complexity of the objects molded almost defies description. The hydraulic accumulators, machine shop and the shop where the numerous molds and dies are made adjoin the main molding room.

An outstanding feature is the use of a conveyor system for the assembly of such merchandise as radio tube sockets. Earlier in its career, the Shaw Insulator Co. assembled such metallic parts, as could not readily be molded directly into the plastic by hand. The necessity

for carrying the various parts to the operators and taking away the assemblies made the operations somewhat expensive, so the alternative of an assembly-line was adopted.

The various molded pieces and the metallic inserts, small nuts, bolts and the like progress along moving conveyors past a line of operators, each one of whom does one specific thing. As a result of this system production has been increased very much, and production costs brought down.



Pumps and hydraulic accumulators.

It is the close cooperation between the different members of the firm staff and their operators and foreman that makes possible the highly efficient work done by this custom molding concern, and enables it to compete with others who simply work at a price without considering quality.

Any one who has ever had the pleasure of going through this plant, is impressed by the speed of the operations, the smoothness of the functioning of all departments and the positive air of cheerfulness that pervades the place.

The diversity of the work handled is strikingly shown by the large exhibits which adorn the walls of the main office and office of the president. Apparently there is no limit to the intricacy of shape and the number and complexity of the metallic inserts that are successfully molded into finished assembles in one operation. One particularly interesting exhibit is a switch-board for multiplex telegraphy, which contains upward of seventy independent metallic pieces, all molded at one time. It formerly took several hundred separate operations to drill and tap the insulating material to insert the various metallic contacts. All of this work is avoided by the skillful planning of the molds.

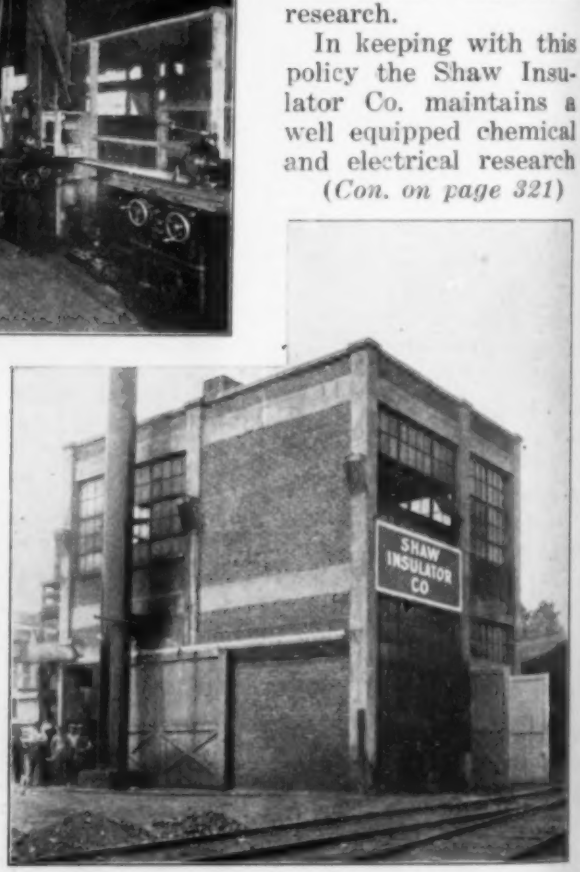
Machine shop where dies and molds are made.

The Shaw Insulator Co. was the originator of the present-day type of radio socket, the one serving to hold the so-called "UV" types of tubes which have four long prongs. It also originated the bases having the prongs molded into place. Many patents have been taken out for definite ways of assembling and molding complicated objects, and there has been considerable imitation by the trade at large.

Mr. Shaw, however, is no believer in so-called "secret processes". In fact, he was the first man in the molding business who threw his plant open to the public and thereby also to his competitors. He believes that what helps the industry as a whole will help every individual connected with it. In a recent interview he expressed his opinion that the world is practically just entering what has been very aptly termed the "Plastic Age", and that there are practically no limits to the molding of plastic materials. He visions hundreds of applications of rapid molding processes to replace slow and expensive machining operations. In the present era of accelerated production, anything which will save time or human labor has a definite value. It is along these lines that the greatest possible reward appears to lie for industrial research.

In keeping with this policy the Shaw Insulator Co. maintains a well equipped chemical and electrical research

(*Con. on page 321*)



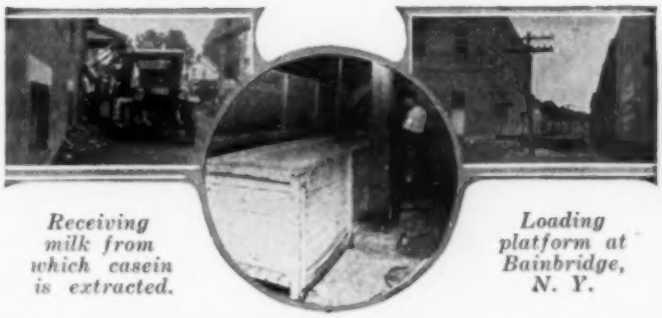
The power plant is separate and located in strategic relation to the railway trucks.

The Versatility of Casein

The valuable properties of this proteid product are being appreciated more widely

By A. C. Blackall

THE present article is a continuation from page 379 of the August issue of this journal, where the manufacture of casein was taken up.



Receiving milk from which casein is extracted.

Curdling vat.

Loading platform at Bainbridge, N. Y.

Casein plastic is resistent to alcohol, benzine and acid, but it is attacked by alkalis. It also absorbs water after prolonged immersion, which means that it is unsuitable for such articles as knife handles, bathroom tiles and basins, and electric storage cells. The casein principally used for such purposes is that produced by the rennet process, and it is essential that the casein be clear, non milky, and low in fat content. The casein is as a rule hardened by formaldehyde solution, although tannin and alum can be employed to give a discolored hardened product, and picric acid will produce an amber-colored product.

The strength of the formaldehyde is usually about 35 per cent, but stronger solutions can be employed if the ventilation is good. About ten days' immersion in the hardening bath is required to produce plates two mm. thick. In some instances the cost of opaque plastic articles is reduced by the addition of various nitrogenous substances, such as horn and hair refuse, to the raw material. In other cases attempts have been made to use the casein extracted from soya beans instead of skimmed milk, but this is a more costly process and there is still some doubt as ot whether this substance is a true casein.

Some time ago publicity was given to a German process for the manufacture of various casein plastics direct from the casein and formaldehyde without the intermediate production of galalith plates. Factories employing this process are understood to have been opened in Austria, Czechoslovakia, and Italy. About $100,000 would suffice for the erection of a plant to produce two tons of finished plastic daily by this process.

Casein paints are very largely employed throughout western Europe, and the value of casein in this application lies in the ability of the substance to unite with caustic lime to form a compound which is rendered insoluble on exposure to air. Cold-water paints made along these lines are sold as pastes, liquids, or as powders in airtight cans. Simple mixture with water renders them available for immediate use. Casein paints of good quality are inexpensive, non-odorous, and are easily worked. Moreover, they dry rapidly—a valuable quality for painting in bad weather.

Of late years a concentrated solution of casein and formaldehyde, known as formolactin, has been used on an increasing scale for painting hospital wards, bedrooms, and living rooms. This product has a disinfecting action which is easily renewed by spraying with 1 per cent solution of formaldehyde. Another paint, made from a mixture of satin white and an alkaline solution of casein, is used as a water-proof covering for playing cards, as it imparts an enamel finish which will take the most delicate multiple - color - printing. Casein silicate paints are also used for painting damp rooms, brick and stone work. When mixed with asbestos these casein silicate compositions give a

(*Con. on page 317*)

Casein Drying Kilns.

Photographs by courtesy of Erinoid Co., N. Y. City.

Resin Suitable for Cold Molding

Stearine pitch, sulfur and phenolic condensation product in combination

THE use of stearine pitch and sulfur in combination with a phenolic condensation product is claimed in a recent patent granted to Clarence A. Nash, and assigned to the Cutler-Hammer Mfg. Co. of Milwaukee, Wis. (U. S. P. 1,574,842, Mar. 2, 1926).

In describing the improved product, the inventors refer back to an earlier patent of L. T. Richardson (U. S. 1,508,124) which deals with the production of a phenol resin.

The present improvement contemplates the incorporation of a quantity of stearine pitch to the condensation product prior to the addition of the filler. Sulfur is also added, the purpose being to effect a sort of vulcanization of the pitch during the polymerization of the resin.

As typical of the way the invention is carried out, the following example is given. A quantity of stearine pitch is melted and to it is added approximately thirty per cent of its weight of a volatile solvent such as benzol, coal-tar oil or the like. A quantity of this thinned material sufficient to contain fifteen parts by weight of stearine pitch is then thoroughly mixed with approximately 142 parts by weight of a phenolic condensation product, which can advantageously comprise substantially fifteen potentially reactive phenolic groups to each six phenolic groups condensed with methylene substance, the corresponding number of potentially reactive methylene groups being also present.

This binder is then mixed with about 500 parts of asbestos together with five parts of sulfur, all by weight, the mixing being done in a kneading machine. Following such mixture, the plastic material may be comminute, screened and subjected to any type of molding process which will give the desired shape to the objects to be made from it.

After thus being cold-molded, the pieces are subjected to a prolonged heat cure at an intensity and duration determined by the size, shape and other characteristics of the objects. This heating will complete the phenolic condensation and at the same time it is believed that a sort of vulcanization of the stearine pitch will take place, due to the added sulfur. The addition of the stearine pitch to the phenolic resin produces a marked increase in flow when molding the products and allows of the use of considerably more filling material and also more rapid molding. Fourteen claims broadly cover the invention.

Publicity---But of the Wrong Kind?

The visor cap is getting a great deal of publicity these days. Like all articles that become suddenly popular, the conscientious objectors feel it to be their heaven sent duty to get out the old hammer and rap the public's pet.

Whether such derogatory comment will have harmful effects on the visor's popularity is doubtful, as the public does not usually allow free advice to affect its buying habits.

To show to what lengths negative comment will go we reproduce two notes *Plastics* found within a few days of each other in two publications, the first from "Men's Wear," a trade paper, the second from a column of comment in the "New York World" and taken from the "Independent."

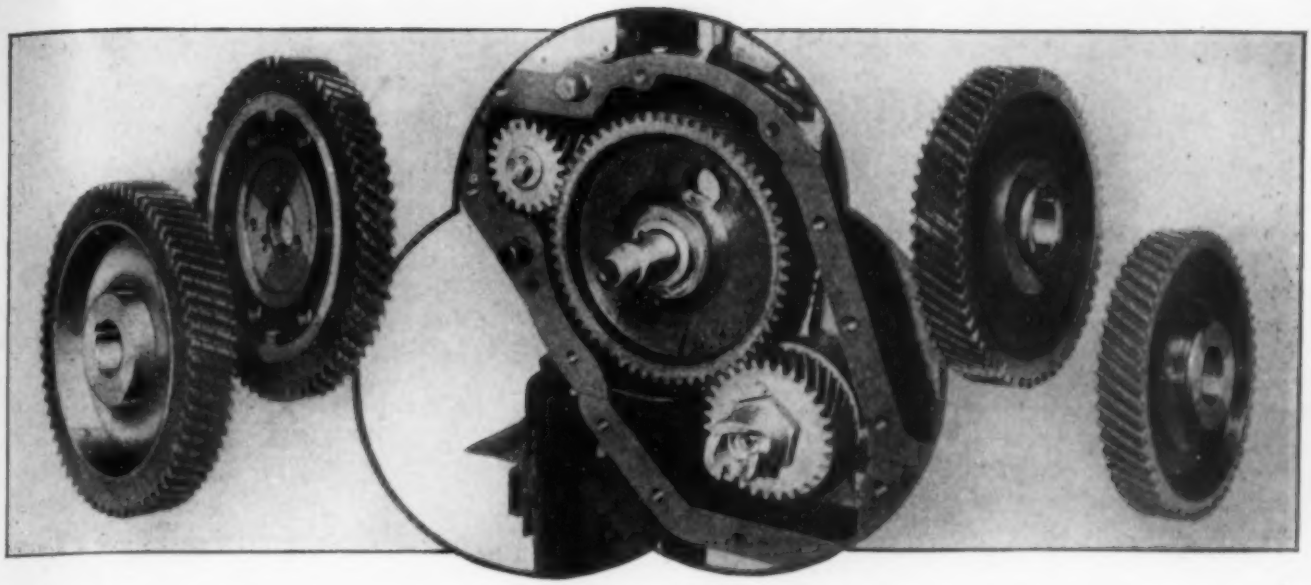
Boston, Mass.—A warning has recently come from Boston that the visor cap eyeshade is a real danger to vision. Dr. Joseph H. O'Neil, president of the Massachusetts Society of Optometrists, is author of the warning.

All the publicity given the visor is not bad, as is shown by this cartoon which appeared recently in the New York World and syndicated nationally.

Continued wearing of eyeshades will end in photophobia, an ailment of the retina, Dr. O'Neil claims. In the explanation it was said by Dr. O'Neil the use of shades under normal conditions cuts off light that is necessary to produce a healthy stimulus to the eye.

Anonymous, "Independent" —The so-called "skeleton cap" or green visor introduced by Miss Wills has spread like a foul epidemic over this free republic. In Boston alone, a conservative city whose population is around a million and a quarter, 600,000 human beings have purchased skeleton caps and have presumably committed the high crime and misdemeanor of wearing them.

A list of the suggestions sent in for prizes will appear in the October issue.



Bakelite Gears an Important Factor in Automotive Equipment

Most of the motor car manufacturers have standardized on laminated gears

By Burte Boyce

EVER since the discovery that non-metallic gears could be utilized industrially, popular insistance on quiet operation has led manufacturers to exert every effort to make such gears practical.

The chief problem confronting automotive engineers working in this particular field has been the comparatively short life of the non-metallic gear. Contact with oil and fuel—and at times with water—is practically inevitable, as the gears are generally used as intermediates in a gear train whose other parts, being metallic, require lubrication. This lubrication, acting on ordinary non-metallic material, has tended to weaken it and lessen its resistance to wear

Light Weight

Freedom from this defect, and a long series of successful results in practical application, are directing the attention of automotive engineers to gears manufactured from one of the products of the Bakelite Corporation. The gears are made of laminated Bakelite—sheets of cloth fibre impregnated with phenol resin in a liquified form, and firmly solidified by a process of heating under pressure. This process bonds, or rivets the sheets together as the pressure increases, turning them out in a unified mass lighter than aluminum but exceptionally strong. The material is then capable of being sawed, punched, shaved, reamed, etc., and these machining operations may be held to very close tolerances. Because of its fine grain and densely homogeneous structure, gear teeth of small pitch can be accurately cut into it. Experience has demonstrated that this gear is practically impervious to oils or liquids, and is consequently able to stand up under long periods of service.

At present the applications of this material are confined principally to intermediate gears and to pinions. On automobiles it is being used in the timing gear train by more than 50 per cent. of the car makers.

Bakelite gears in most instances do not require shrouds or end plates. Long since past the experimental stage, this Bakelite product serves effectively on many types of electrical equipment. It is on record that gears of this material with a maximum dimension of no more than ½ inch have been successfully used. In contrast there are gears with a 14-inch face and a 28-inch diameter, also made of laminated Bakelite. Laminated gears are being used both on fractional horsepower motors and on motors of over 100 horsepower—a fact. which is perhaps significant of the still broader scope of usefulness which will characterize their future service.

Fabricators Meet

A meeting of the Pyroxylin Asso. is scheduled for 3 p. m., September 13th, 1926, at the Aldine Club, 200 Fifth avenue, N. Y. City. All branches are invited to attend.

Plastics From Smokeless Powder

Difficulties due to high viscosity and dark color overcome by recent discovery

ALTHOUGH the European war is already fading into the background of history, nevertheless there are still in existence large quantities of smokeless powder which, due to the fact that this material was made in a physical form which does not permit its use in hunting ammunition, is more or less useless.

A possible use for this large amount of otherwise perfectly good cellulose nitrate was sought for. The smokeless powder contains about one-half of one percent of diphenylamine, which was added to increase its stability.

E. I. DuPont de Nemours & Co. have had assigned to them U. S. Patent 1,577,075, March 16, 1926, the invention of Earle S. Pitman and George F. Hunter both of Parlin, N. J. This invention concerns itself with the removal of dark colored impurities in commercial smokeless powder, so that the same may be employed for the production of cellulose nitrate plastics.

The principal objection to the use of this powder in arts such as liquid coating compositions and cinematographic films, are (1) its relatively high viscosity, making difficult the preparation of solutions of high solid content, and (2) its dark color, due to the presence of diphenylamine introduced as a stabilizer, organic impurities (mainly decomposition products of the niphenylamines), and inorganic salts (chiefly iron derivatives.).

Reducing Viscosity

The first of these objections has been overcome by the development of efficient methods of reducing the viscosity of nitrocellulose solutions and the second in great part by the alcohol extraction process described and claimed in the patent of R. G. Woodbridge, 1,439,656 December 19, 1922, according to which all but faint traces of the diphenylamine can be removed from the powder grains. Although the material obtained by alcohol extraction processes answers the requirements for artificial leather coatings, it is not clear enough for use in such compositions as clear pyroxylin lacquer of high nitrocellulose content, cinematographic film, and transparent or ivory pyroxylin plastics.

When the armistice was signed eight years ago, a tremendous amount of explosives was left over.

A good deal of it recently exploded at the Lake Denmark arsenal with disastrous results.

While this method deals only with the cellulose nitrate explosives, it will prove useful even in peace—as the nitrating plants are best kept in condition by keeping them going at all times.

Decororizing

The objectionable color which is perceptible in the above mentioned articles when they are composed in large part of pyro powder nitrocellulose, can be satisfactorily removed by treating the powder, preferably before solution thereof in the ordinary organic solvents, with a dilute hydrochloric acid solution containing preferably between 0.05% and 15% of hydrogen chloride. An aqueous hydrochloric acid solution is preferred. Various other acids capable of transforming the iron derivaties into soluble compounds can be used in place of hydrochloric acid, though hydrochloric acid is believed to be best suited for purposes of this invention.

The complete process in its preferred form comprises, generally speaking, (1) extraction of the diphenylamine with solvents which dissolve it but do not dissolve the nitrocellulose, (2) treament of the diphenylamine-free powder with reagents, either acid or alkaline, to render soluble, either in water or organic solvents, the impurities and decomposition products remaining in the powder, and (3) extraction of the powder by substances which are solvent for these decomposition products but are not solvents for the nitrocellulose.

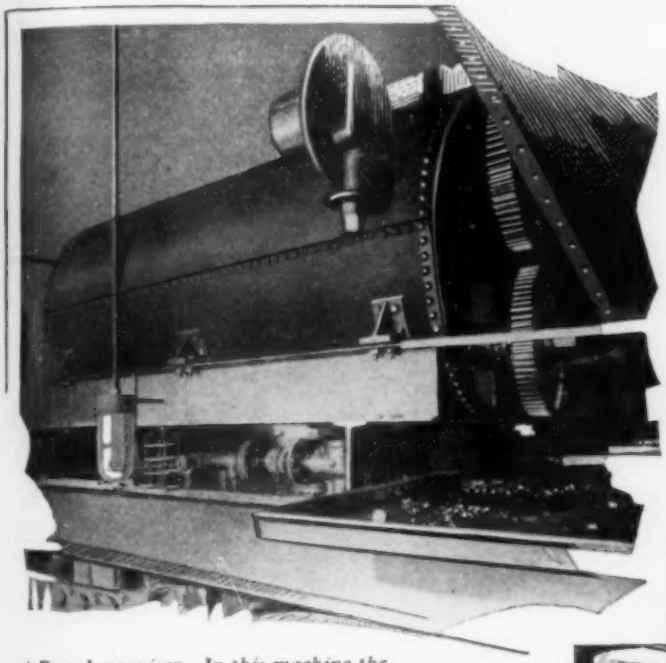
Hot denatured alcohol (that is, ethyl alcohol) is the solvent which is preferred for both steps 1 and 3. The extraction constituting step 3 is preferably performed, in part, concurrently with step 2 by using for step 2 hot alcoholic hydrochloric acid in which the HCL content is from about 0.05% to 15%, and preferably 1%.

The pyro powder to be subject to the above-described treatment should be in such a physical condition as to expose a large surface, the area of this surface being desirably not less than 1,000 square feet per pound of powder. Thus, if the grain size of the powder available is too large, the powder may be ground (preferably under water or alcohol), or otherwise comminuted, to such a fineness that it will all pass through a 40-mesh sieve.

Other Acids

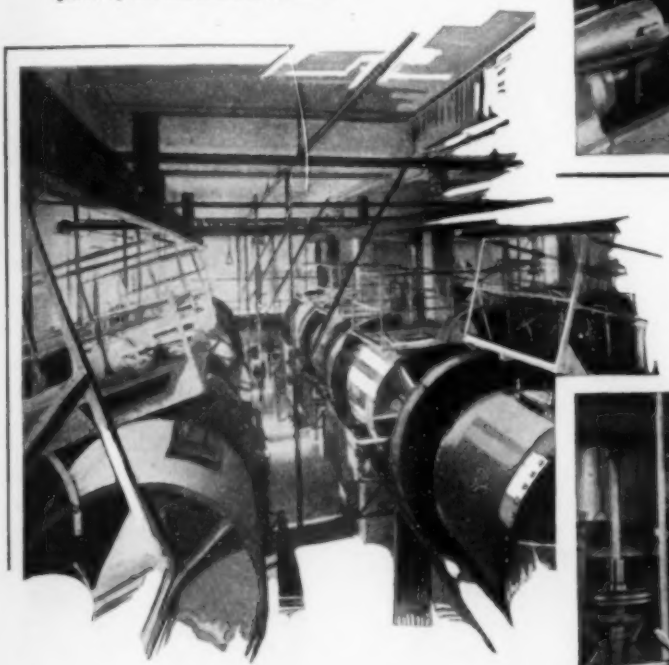
Oxalic acid is almost as effective as hydrochloric acid in solubilizing the insoluble coloring matter in pyro powder, but sulphuric, nitric, and acetic acids, although having some solubilizing action, are far less effective than hydrochloric or oxalic acid.

THE FINAL STAGES OF DUCO MANUFACTURE



A Duco base mixer. In this machine the pyroxylin is broken up and reduced to fluid form by the addition of solvents

After the base mixing operation is completed, the dissolved cotton, a syrupy liquid, is filtered to remove any impurities still remaining in it. This view shows one of the Duco base filter presses used at Parlin



Duco is produced for the market either as a clear or colored liquid. If a colored Duco is being made, the required pigments are ground into solution and incorporated with the base mixture after it has passed through the filter press

Duco mixers —in which the final mixing operation takes place

The Pyroxylin Lacquers, typified by the Dupont Company's "Duco" are becoming a national industry that undoubtedly will consume immense quantities of cellulose nitrate and solvents. Photographs by courtesy of The Dupont Magazine, from a recent issue.

Cellulose Acetate Windows

Thin film reinforced with wire mesh has many useful applications

CELLULOID sheets sufficient-thick to have the requisite strength for use as windows are quite expensive, and in time become rather brown and also quite brittle. For use in automobile curtains, and as coverings for pictures, exhibits, etc., they have had a long spell of popularity.

During the late war a material was developed abroad, mainly for camouflage purposes, that is finding increasing application for commercial and domestic uses. It consists of a very thin film of the relatively non-combustible cellulose acetate, reinforced by means of woven wire-cloth, so that it has the requisite structural strength to be used wherever light-weight windows are desired.

On casual inspection the material looks like ordinary tinned wire screening, except that the spaces between the wires are filled up by the film of cellulose acetate. A particular advantage of the material, which, incidentally, is not transparent like glass but translucent like oiled paper, is that it will transmit ultraviolet light, which ordinary glass does not permit to pass.

This make it especially valuable for hospital windows, for hot-houses and so-called "cold frames" for intensive gardening, and also as covering for chicken-coops as it is said that the ultra-violet light is good for the hens. Its extremely light weight, but little more than ordinary screening, renders it suitable for removable sash frames; and the fact that it can be bent freely makes it applicable in places where glass would be impossible to use. It is waterproof and no more combustible than wood, not being set afire by a spark, as actual tests have proven.

It can now be procured in the United States, not only in the colorless grade, but in various tints as well. Its versatility assures a promising future for the product.

History and Rise of the Casein Solids Industry starts in October!

Re-using Casein Solid Scrap

Preliminary cold pressing

THE utilization of the scrap and waste resulting from the fabrication of objects from the casein plastics has hitherto proven to be quite a problem, and the only practical application for this material has been its use as a fertilizer. As it contains nitrogenous material which is slowly decomposed in the soil, this is a rational use of the waste product, but requires rather fine grinding, all of which makes it a somewhat expensive proposition.

A recently granted German patent (423,619, Application date Nov. 3, 1923, to George Honsberg, of Munich, Germany) describes a process which allows of the use of trimming, cutting and other casein plastic scrap for the production of new material. For this purpose the finely powdered waste is pressed cold under considerable pressure, and then the preformed articles are further heated under pressure until they become welded together into a firm and coherent product. The purpose of the preliminary cold pressing is to remove as much of the air between the particles as possible, for otherwise the particles on heating would become non-plastic and would not weld together.

A specific method for carrying out the invention is given, and reads as follows: 20 grams of the powdered casein plastic waste are pressed cold with a pressure of 120 kilograms per square centimeter (abt. 1700 lbs. per sq. inch.) or even higher, and then, while still maintaining the pressure, heated to 90 to 140°C (192°F to 284°F). On cooling the products can be taken from the mold. The process is stated to be suitable also for the waste from articles made from hardened glue.

Dyed Celluloid Objects

Coloring before final molding

RICHARD SEIDEL has obtained a German Patent (No. 423212, application date April 12, 1924) for a process for producing colored objects from pressed celluloid or horn powder.

As is generally known, objects made from such materials by pressing in hydraulic presses, are usually so hard that the application of colored designs by either painting or stenciling is almost impossible as the colors will not penetrate into the plastic material and hence fail to be permanent.

The invention consists in producing the objects in two distinct stages. The products are first molded under comparatively light pressure, so as to be somewhat absorbent, after which the designs or colors are applied. This can be done by allowing a solution of color of dye to act upon the same. Following

(*Concluded on page 328*)

Enamel Imitated by New Process

Pyroxlin sheets, backed with metal, closely simulate engine-turned decorative ware

LEONARD JAMES GLOSTER, of Birmingham, England, describes an interesting method of producing effects resembling engine-turned metal plates by impressing a design upon the back of a transparent sheet of celluloid or the like and then spraying metal on the surface. His invention, covered by U. S. Patent 1,578,982, March 30, 1926, describes the process as follows:

The invention relates to a new decorative material for ornamental panels, plaques, or the like adapted for application to articles of jewelry, clocks, watches, hand-bags, ornamental cases and boxes, brushes, mirrors, toiletware and various other articles.

Just Like Enamel

The object of the invention is to provide simple and inexpensive means whereby the appearance and effect of enamel ornamentation can be very closely imitated.

Enamel for the purpose of ornamentation is generally in the form of a coloured translucent layer applied to a silver or other metal surface which has previously been engine-turned or otherwise treated. The surface so produced is of attractive appearance, but is extremely expensive and is very fragile, as a slight blow or a sudden change in temperature is sufficient to break or crack the enamel.

By my invention a similar effect can be produced very cheaply, and the finished article cannot readily be damaged and is proof against cracking under any conditions to which it is liable to be subjected in use.

A further object of the invention is to provide a decorative material which is of extremely attractive appearance, and can be readily produced in any desired colour or shade, or may be uncoloured if desired or arranged to give the appearance of a transparent enamel over engine-turned gold, silver or other metal.

FIG. 1

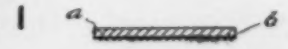


FIG. 2

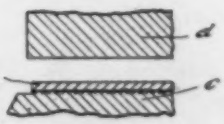


FIG. 3

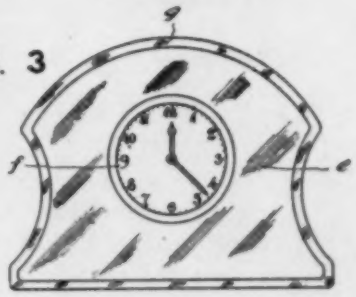
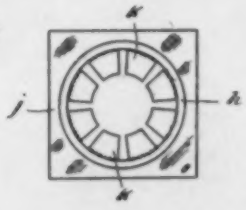


FIG. 4



Another object is to provide a decorative material which can be supplied in panels or sheets of any desired size or shape and bearing any desired pattern. The material is thus made available for a wide variety of different purposes.

It also comprises the manufacture of a decorative material fulfilling these objects by impressing a pattern on a surface of a translucent and flexible sheet and applying to the impressed surface a thin coating of metal or other suitable opaque substance.

Preferably the sheet is of celluloid and the metal backing is sprayed therein so as to obtain an even and thin coating. The other face of the sheet, which is the finished article is the outer face, is preferably highly polished. Light striking the polished face of the sheet passes through the sheet and is reflected from the impressed and coated back, and the appearance of the sheet is that of an engine-turned metal plate having a surface layer of translucent enamel.

Several features of the invention have been illustrated, and in these drawings:—

How It's Done

Figure 1, is a section on an enlarged scale of a piece of material made in accordance with my invention.

Figure 2, is a diagrammatic section showing one method of impressing the sheet of material.

Figure 3, is a front elevation of a clock showing one method of utilizing the material.

Figure 4, is a diagrammatic section showing one method of impressing a pattern on the inner surface of a tube.

As shown in Fig. 1 the material consists of a sheet of celluloid or cellulose acetate *a* having a suitable raised or impressed pattern on one face to which is applied a thin coating *b* of metal or other suitable material.

Various methods may be employed for impressing the patterns on the back of the sheet, but in practice the method illustrated in Fig. 2 is convenient. The desired pattern is engine-turned, engraved or otherwise

(*Continued on page 318*)

Facts and Figures on Plastics

Compilation, from official sources, shows trend in this growing industry

STATISTICS of the plastics industry are by no means easy to procure, if accuracy is the determining factor. The combined value of the products encompased by the expression "Plastics" as we view it, is enormous, although it would be still greater were we to include items commonly called plastics, such as ceramics, glass and calcareous cements.

Just recently the Department of Commerce, Bureau of the Census, has completed the compilation of the Census of Manufactures for the year 1923, which also includes a comparison of the industries from 1914 to that year. We quote from the pamphlet entitled "Chemicals, not elsewhere classified etc.,"

As to pyroxylin alone, the Department of Commerce furnishes the following figures, for 1914 to 1924:

Here production is way ahead of importation. The figures from the Department of Commerce are:

Pyroxylin Plastics

YEAR	PRODUCTION	IMPORTS	EXPORTS	
			(2) In blocks, rods and sheets	(2) Manufactures of:
1914	—(1)—	——	—(1)—	
	* $3,778,374	——	$1,639,046	
1919	$3,914,377	——	—(1)—	
	* $24,666,175	——	$7,966,493	
1921	$13,966,108	38,451 lbs.	—(1)—	
	* 21,678,285	$41,990	$2,276,722	
1923	27,651,910 lbs.	1,322,743 lbs.	1,940,071 lbs.	637,856 lbs.
	$17,682,049	$1,831,783	$2,346,789	$921,817
1924	** ——	1,309,454 lbs.	2,003,983 lbs.	788,802 lbs.
	——	$1,632,848	$2,017,417	$1,045,318

(1) Quantity not stated.
(2) Pyroxylin products known as Celluloid.
(2) Pyroxylin products known as Celluloid, Pyralin, Viscoloid, etc.
* Includes collodion.
** Production figures from the Census of Manufactures (Chemicals), published bi-ennially only. 1925 issue not ready for publication.

Table 14.—Group VIII, Plastics, by Kind, Quantity, and Value: 1914 to 1923

Kind	1923	1921	1914	1919
Number of establishments	46	40	35	24
Value of plastic products*	$102,229,807	$58,836,711	$77,477,041	$13,895,784
Pyroxylin, including collodion:				
Number of establishments	20	19	14	.....
Total calue	$33,458,361	$16,036,002	$34,536,70	.....
Plastics†—				
Number of establishments	7			
Production, pounds	27,651,910			
For sale, in form for further manufacture—Pounds	23,980,116			
Value	$17,682,049			
Made and consumed, pounds	3,671,794	21,678,285	33,914,377	.....
Collodion, pyroxylin solutions, etc.—		$13,966,108	$24,666,175	$3,778,374
Number of establishments	13			
Production, pounds	20,937,584			
For Sale—Pounds	17,795,670			
Value	$4,476,774			
Made and consumed, pounds	3,141,914			
Finished articles of pyroxylin made in the producing establishments, value‡	$11,299,538	$2,069,894	$9,870,395	
Rubber substitutes:				
Number of establishments	10	9	11	
Pounds	11,208,115	8,078,078	7,291,776	
Value	$2,922,299	$2,232,845	$1,309,644	$5,526,740
Artificial silk, visca, cellophane, etc.:				
Number of establishments	8			
Pounds	36,476,625			
Value	$59,051,385	$40,567,864		
Other plastics, value§	$6,797,762		$41,630,827	$4,590,670

* Not including photographic films of cellulose nitrate or cellulose acetate (for motion pictures, etc.).
† Sold under such trade names as "celluloid," "fiberloid," "pyralin," "viscoloid," etc.
‡ Handles for cutlery, umbrellas, toilet articles, novelties, fancy articles, etc.; reported by 5 establishments for 1923.
§ Phenolic condensation products, cementation plastics, etc.

As the above figures show, "Plastics" covers an industry that runs to big figures when expressed in dollars.

The cellulose nitrate solutions, classified under the generic term of "Collodion" are also an important item, but complete figures are available only for the 1923 production, and imports for a few years.

Collodion

Year	Production	Imports	Exports
1914	**	——	**
		$295,058	**
1919	**		
		$ 64,602	**
1921	**		
		$153,190	**
1923	20,937,584 lbs.	(1) 95,883 lbs.	**
	$4,476,774	$65,631	**
1924	——	(1) 154,070 lbs.	**
		$135,503	

** Included with Pyroxylin.
(1) Included in the import total of Pyroxylin.

Casein Products

As regards the manufacture of casein solids, no official figures are available, except the total production and imports of what is listed as "Casein," but this, of course, includes a lot of material that finds other applications than for plastics, such as for example as adhesives, sizes and wall-finishes. It is quite noticeable, however, that both production and importation are considerably on the increase.

Relative to shellac plastics, the statistics are equally silent. Only figures on shellac importa-

(*Continued on page 324*)

Contest Announcement

Major Prizes Not Yet Awarded

AUGUST 25th rolled around, and the contest came to a close with quite a few last-minute suggestions. Now that we have had a chance to look them all over, we are very reluctantly compelled to state that no one met all the requirements set forth in the conditions.

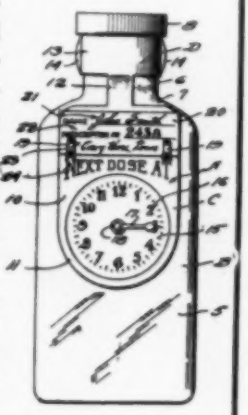
The main point, and essential for success, was absolute novelty and that is something that not one of the contributors achieved. It seems rather remarkable, too, for modern conditions apparently give play to the imagination. Nevertheless, fully ninety-five percent of the suggestions received were not only old, but positively hoary with age.

It appears as though very few of the suggestors took the trouble to look up the archives of the thermoplastic art before coming to the front with their ideas, many simply contenting themselves by entering a single word and the term "Plastics." Had they taken the trouble to look up even the pyroxylin plastics in Worden's monumental work,

(*Continued on page 319*)

$25.00 to Robert Harmon, Sr.
509 W. 176th St.
New York City.

For a novel celluloid attachment for medicine bottles and the like. Mr. Harmon has patented the device, which consists of a form of label, attachable to the botle, and by means of which it is possible to mark the time at which the next dose of medicine is to be taken. It also bears arrangements for inserting the name of the patient, prescription number and other indicia. We shall give a more extended account of the device in a forthcoming issue.



$25.00 to Percival Wood,
1334 3rd Ave.,
New York City.

For a novel attachment to shaving brushes. Consisting of a pyroxylin plastic disc to surround the brush at the point where the bristles are fastened, to prevent the lather from running down the arm of the user. While it is obvious that brushes with such discs have been made for other trades, as paint, paste, etc., we feel that these should prove excellent sellers, and that the suggestor is hence entitled to the above award.

$25.00 to N. L. Clouston
P. O. Box 130
Granby, Que., Canada.

For a novel form of celluloid hair ornament, particularly designed for bobed hair. It consists of a suitably formed pyroxylin plastic piece to fit the spot on the neck of women who have their hair bobbed, and where the joint between the hair and the skin is not perfect. In conjunction with a textile bandeau, it makes a very attractive headdress when no hat is worn. Although hair ornaments are distinctly not new, this particular type was considered meritorious.

$25.00 to M. V. Bostwick
29 Berkely Place
Bloomfield, N. J.

For the suggestions as to the making of typewriter frames, especially of the portable kind, of phenol resins, such as Bakelite. Such molded frames would be as strong as the castings now in use, and be much lighter. Bakelite has been used for various typewriter parts, such as the keys, ribbon-spools, platens, etc., and has been suggested for other typewriter parts in the past. Its serviceability entitles it to the above award.

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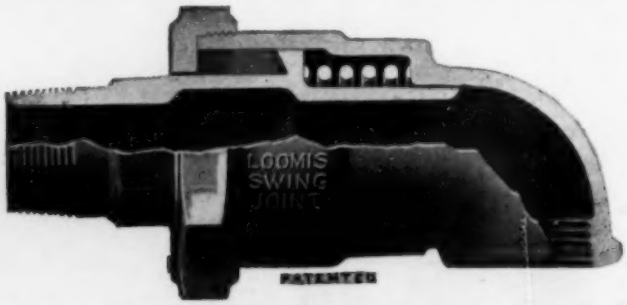

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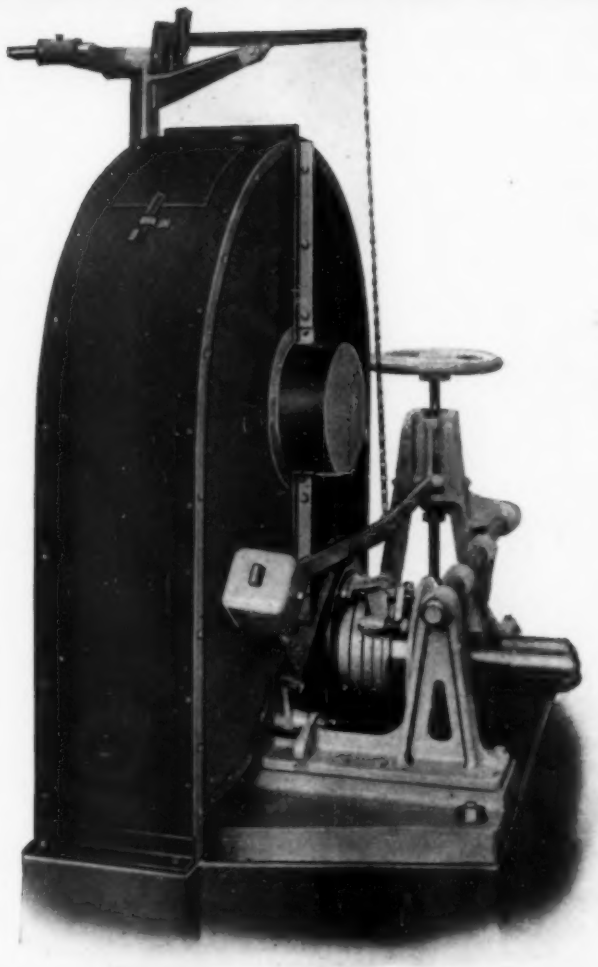

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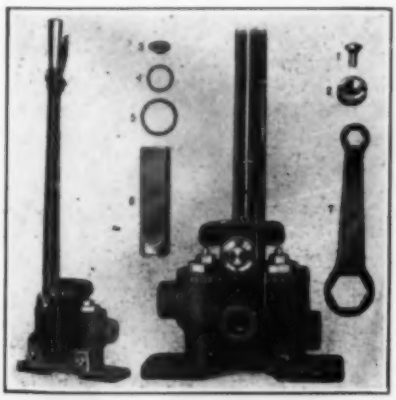
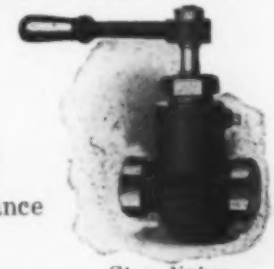


Press Operating Valve

CARVER HYDRAULIC VALVES
with
Monel and Stainless Steel
renewable parts



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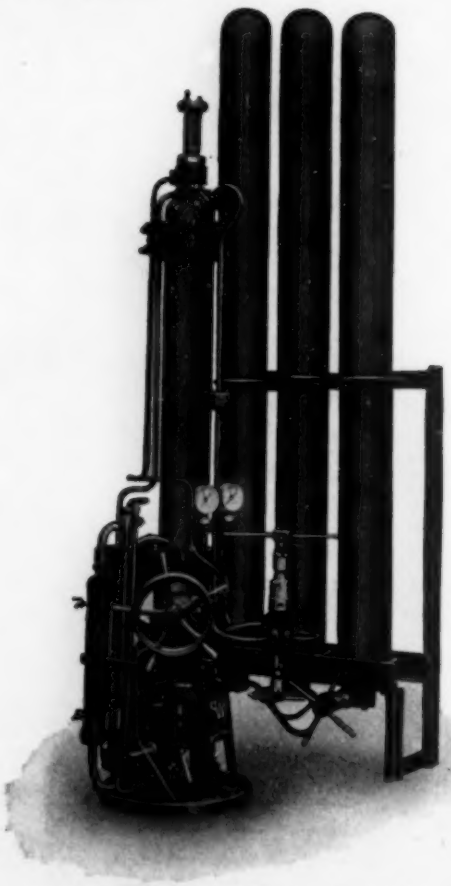

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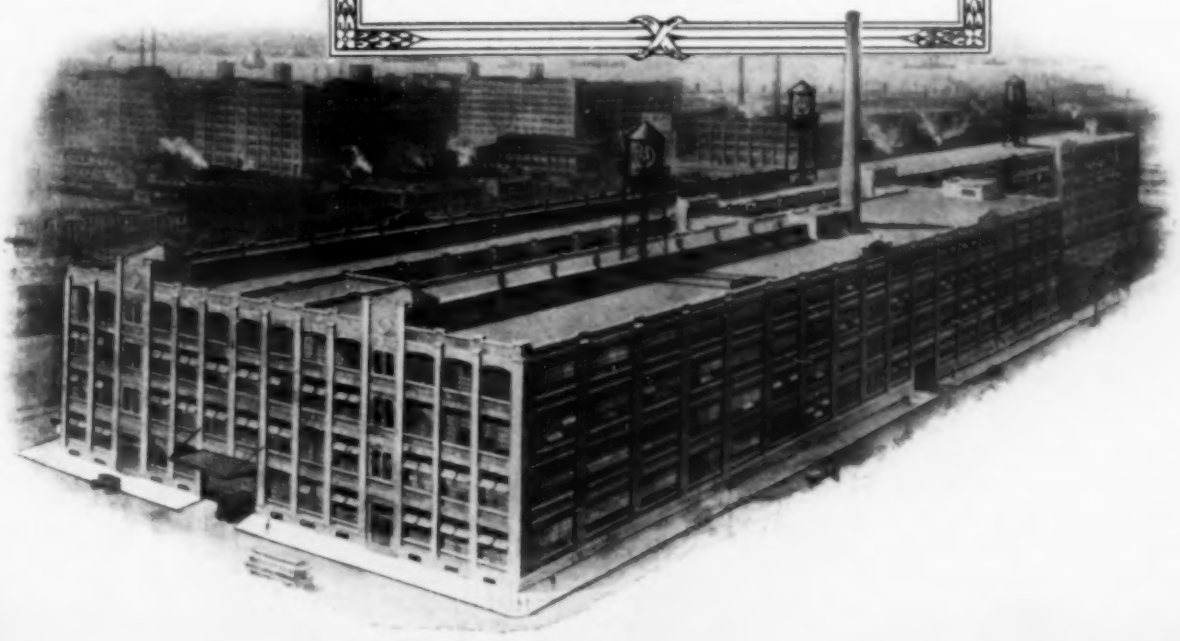


EDITORIAL · IMPRESSIONS

Pyroxylin Plastics at a Dime

ONLY the other day, we had an occasion to visit one of the most pretentious ten-cent stores in the Metropolis, and were considerably impressed—we shall tell you how in a minute—by the very large number of plastic articles which were offered for sale at prices that occasionally were a distinct shock.

The main show window of the place, located at one of the busiest corners of the city, was entirely devoted to an elaborate display of "pearl" necklaces that were priced at "10 cents for the necklace and 10 cents for the clasp." Close examination showed that the product was quite excellent, but its origin was shrouded in mystery. Just how a manufacturer can afford to turn out such attractive merchandise to sell at so insignificant a figure remains unexplained.

The effect on the public, who is used to paying at least a few dollars for a passably decent string of imitation pearls, is another problem. How can the legitimate manufacturer of imitation pearls, who prides himself on the quality of his goods, and their durability, compete with such a display? This flood of low priced goods can have but one effect—to cheapen the whole line of products and to kill off eventually the better class of pearls by making them commonplace.

But that was only the beginning. In the very next window there was an equally attractive display of what on close examination proved to be pyroxylin plastic tooth brushes—at a dime each. They were not only in white ivory and the conventional transparent amber and green shades, but in mottles that for sheer daring were unmatched by anything turned out in our country—for each brush bore the legend "Japan". They were pink and white, cerise and white, lavender, purple, dark brown and gold—every conceivable color. Little long thin pyroxylin plastic boxes, with hinged covers, to keep them in, perforated at one end to let the brush dry, and in colors to match the stems, could be had for another dime. And they sold like hot cakes.

Within the store, there were more unusual sights to strike terror into the heart of the toilet goods manufacturer. Believe it or not, here were pyroxylin plastic mirrors, nail-brushes, hair-boxes and powder puff containers, combs and other accessories, each at one thin dime per! Close examination of a mirror purchased disclosed the fact that it was made of very thin sheeting, (a green and white mottle of excellent appearance), filled with common cardboard, with a sheet of white paper as an underlay. And, you may remember, the Pyroxylin Plastics Fabricators were only a short while ago "standardizing" on 400 stock for mirrors!

Then there were combs—by the hundred; eye shades; anti-glare shields; dolls and toys; and even little molded incense burners, which, we hope were not what they seemed to be. Nothing over ten cents, remember; and there must have been some profit or this concern would not have handled the goods.

What is the answer?

The duty on pyroxylin plastic manufactured objects is 60% at valorem; and still this material pours in. At least the tooth-brushes were marked "Japan". How much of the rest of it is imported? In another column we give some interesting statistics as to production and exports of plastic materials. The wise reader can easily write his own epitaph on the low-priced pyroxylin plastics trade unless relief is obtained in the form of better tariff protection.

"Phenol Resin"

Ever since Bakelite first attracted the attention of the general public about fifteen years ago, and the phenolic condensation products became more and more popular, there has been an urgent necessity for a comprehensive name or term to designate these substances.

The mere words "phenol resin, phenolic condensation product, synthetic resin" etc., mean nothing to the public-at-large. The average purchaser knows nothing about the nature of the material, except that he soon finds out what is good.

Bakelite and Redmanol have earned for themselves an enviable reputation; the latter especially among users of smokers articles. The advent of radio made the molded and laminated Bakelite material just as well known. Now the public is beginning to call every product that resembles Bakelite by that name. The Corporation objects—justifiably; but then what can anyone do about it? That is one of the concomitants of success. An individual manufacturer who appropriates a trade-mark can be sued, but the public at large can't.

Fortunately the company has evolved an excellent new trade mark, adopted a little over a year ago, so that even if it should happen that a lot of new phenol resins should be thrown on the market in the future, the "original" Bakelite will still be recognizable. But a popular generic name for this class of goods would be cordially welcomed.

Versatility of Casein

(*Continued from page 303*)

en excellent fire-proof paint for wood and canvas.

The by-products from casein manufacture also offer very attractive possibilities. The whey obtained after the precipitation and removal of the casein from the skimmed milk can be used for producing milk sugar or lactose and milk albumen. Whey solids are used in the confectionery and baking industries, invalid foods, and as stock and poultry foods. The usual method of preparing lactose or milk sugar on a commercial scale involves evaporation of the whey in the vacuum after neutralization with lime, clarification with alum, and crystallization. The product is then purified by animal charcoal and finally recrystallized.

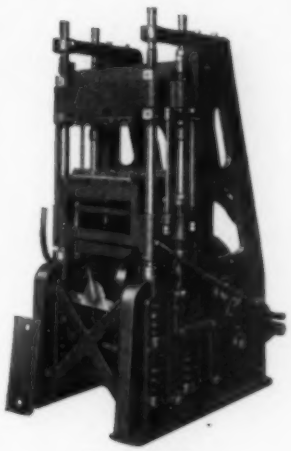
An outlet for milk sugar is found in infant and invalid foods, in medicine for the treatment of wasting diseases, in homeopathic preparations, and also in alcohol, vinegar, chocolate, stout, and lactic acid. It can also be used in high explosives as a penta-nitro-lactose.

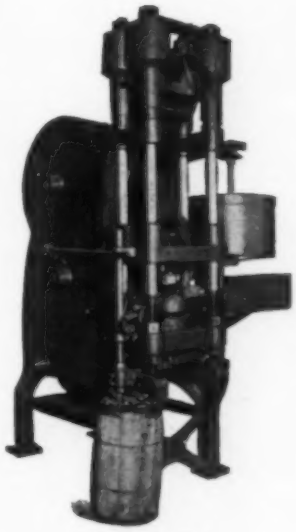
In the range of plastics, and, in fact, in the entire range of commercial products, it would be difficult to find one of more universal application than casein.

New Fountain Pen Co.

The Wallace Pen Co., Columbia, S. C., recently formed by Dr. J. M. Wallace, Columbia, and associates with a capital of $100,000, is arranging for the early establishment of a local plant to manufacture a new type of fountain pen. The initial factory is reported to cost about $25,000.

BLOOD PLASTICS!
See
October Issue


Model B-1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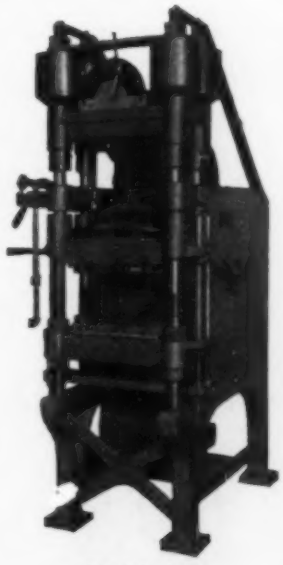

Model A-1

The Molding Machine Presses

with the Controlled Spring Pressure

The greatest sensation of the plastic industry.

All sizes, with but one result —satisfaction—economy.

May we send you our bulletin?

Terkelsen Machine Co.
330 A Street
Boston, Mass.

Enamel Imitated by New Process

(*Continued from page 309*)

cut on one face of a flat plate *c* of silver or other metal and this plate is employed as one die of a pair between which the celluloid sheet is pressed in a suitable press and at a suitable temperature, the other die *d* having a smooth polished surface to give a planished surface to the other side of the sheet.

In a common method of manufacturing sheet celluloid the final process is the pressing of the sheet between heated and planished dies, and this process may conveniently be replaced by that described above so that the cost of manufacturing the sheet is not appreciably increased.

On removing the sheet from the dies the engine-turning will be impressed on one face of the sheet, and this face is then coated with gold, silver, bronze, or other metal by any of the known metal-spraying processes.

Use With Lacquer

In one process which is found satisfactory in practice the metal in finely-divided form is mixed with a lacquer or other suitable liquid and is blown onto the surface by air pressure. The same result may also be obtained by the known process of spraying fused metal upon the surface by air pressure.

Celluloid sheet of any desired colour or shade may be employed to imitate enamel of any colour and the effect may be varied by employing a sprayed coating of different metals on the back.

The finished sheets may be employed for a wide variety of purposes which will be apparent to those familiar with the art. For example, they may form panels for the sides of a handbag, fronts for ornamental clocks, linings for cigarette cases, or be inset into the lids and sides of boxes.

A clock has been illustrated by way of example in Fig. 3 in which the surround *e* for the clock *f* is formed from a coloured sheet of my improved material coated on its rear surface with silver and enclosed within a suitable silver or other rim *g*. The appearance of the surround is identical with that of coloured enamel on an engine-turned silver plate, and could not be distinguished therefrom except by expert examination.

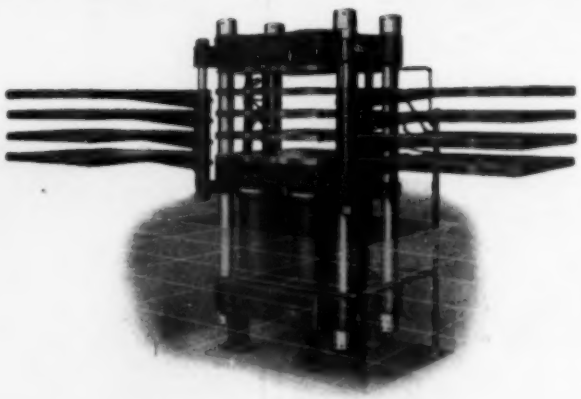
Where a circular sheet of the material is required the engine-turning is preferably of a circular pattern, and where the material is required the tubular form, a pattern may be impressed on the inner surface of the tube in the maner illustrated diagammatically in Fig. 4.

In this case a tube *h* of celluloid or cellulose acetate is enclosed with a cylindrical aperture in a block *j*, the aperture being of such a diameter that the tube may be readily inserted therein.

An expanding mandrel is then inserted into the tube having the periphery of each segment *k* engraved or engine-turned with a suitable pattern and the mandrel is expanded to impress this pattern on the inner surface of the tube. This inner surface is subsequently coated with metal as described above and the resulting tube has the appearance of an engine-turned or engraved metal tube coated with enamel.

The presence of the metal coating on the back of a sheet of celluloid or cellulose acetate does not impair its flexibility, and where the material is employed for lining cigarette cases or the like it may be moulded to any desired contour by pressing between dies which are warmed to such a temperature as temporarily to render the material plastic, the material regaining its normal elasticity on removal from the dies.

French Hydraulic Machinery



A plant with every facility for producing any type of hydraulic equipment.

New bulletins and data sheets are mailed regularly. May we add your name to our mailing list?

The French Oil Mill Machinery Company
Piqua, Ohio

New York **Cleveland** **Chicago**

Contest Prizes

(*Continued from page 311*)

"Technology of Cellulose Esters" they would have soon found out that they were hopelessly out of the running.

However, and be that as it may, we have finally decided, after a conference with the judges, to award fourth prizes for suggestions that, although they are not entirely novel, at least appear to have sufficient merit as a merchandizing proposition to entitle their sponsors to some consideration. Considerable elimination was necessary to choice.

Just to give our readers a little idea of what has been sent in, we are preparing, for publication in the first birthday number of PLASTICS, a complete list of all the suggestions. Also, we shall point out wherein these were old, giving specific reference.

Later on, with proper permission, we shall give a complete list of all the uses to which the pyroxylin plastics have been put, based upon the bibliography given by Worden in Part 4 of Vol. 1 of the work just cited. We feel confident that such a list will prove of inestimable value to all readers of our magazine who are contemplating suggestions for this and other plastics.

The main prize still remains to be won. We are keeping the offer open indefinitely. If one comes along with what the judges consider to be a real and genuine NEW USE, he shall have the hundred dollars. Apparently, what is needed, is the dissemination of information on just what the various plastics are useful for.

PLASTICS

DIRECTORY, INDEX & BUYERS' GUIDE

out in December.

For announcement see p. 299

PLASTIC MATERIAL FORMING PRESSES

METALWOOD

Pumps Accumulators Valves

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WOOD FLOUR is soft powdered wood, light in color and more or less granular under microscope.

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WRITE FOR SAMPLES AND PRICES

BECKER-MOORE & CO. Inc.

World's Largest Manufacturers of Wool Flour

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The Farmers' Purchasing Power

Retail trade in May, as indicated in the data compiled by the Federal Reserve Board, was 7.3 per cent. greater than in the same month a year ago. It is significant that the most substantial increases were reported from sections that are mainly agricultural. The best showing was made by the Chicago, St. Louis, Atlanta and Richmond Federal Reserve Districts. Sales by the two leading mail-order houses were 14.2 per cent. greater than a year ago, and these supply further evidence that rural buying is well sustained. Although there is much complaint of hard times in the corn belt, there is nothing in current trade statistics to show that the people there have materially curtailed their consumption.

The Minneapolis Federal Reserve District is the only one to report a decline in retail trade as compared with last year, and yet this is the region where the 42-cent duty on wheat was supposed to make the farmer prosperous.

This should be indicative of greater sales of toilet requisites and electrical goods.

Some Recent Trademarks

The word ZONOLITE. For a natural substance having insulating, decorative and acid-resisting properties, * * * and probably for many purposes which are unknown at the present time. Claims use since May 9, 1923. Application filed Jan. 12, 1926.

Ser. No. 229,386, 229,387, 229,-388. Hercules Powder Co.

A fanciful representation of a man clothed only in animal skin and bearing a sort of club, evidently intended to represent the mythological figure Hercules. For (1) high-boiling solvent for gums and cellulose esters; and (2 and 3) for nitrocellulose. Claim use since Mar. 1, 1926. Appl. filed Mar. 30, 1926, (2 and 3) Use since Mar. 10, 1926.

(*Continued on page 331*)

Nulite Polish Co., Inc.

Fifty years' experience manufacturing all abrasive and finishing compositions are now offering to the fabricators and moulders of all casein, pyroxylin and bakelite products a finishing composition surpassing anything yet achieved in this line.

We solicit your inquiries and will cheerfully furnish samples on request

Nulite Polish Co., Inc.
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"PAISPEARL" SOLUTIONS

have no equal for dipping or spraying when that beautiful pearly effect is desired.

The exquisite lustre of the natural Pearl so much in vogue can easily be applied on GLASS, WOOD or CELLULOID articles. We will gladly coat a sample for you to demonstrate the wonderful improvement it effects, at a minimum of cost.

Write to us for full information.

PAISPEARL PRODUCTS, *Inc.*
65 NASSAU STREET NEW YORK CITY
LABORATORIES—Eastport, Me.
Yonkers, N. Y.

Shaw Plant

(*Continued from page 302*)

laboratory. This laboratory has been instrumental in helping the development of a number of new substances amenable to plastic molding, and is always open to anyone who believes that he has a genuinely new and valuable product which might prove suitable. This is certainly an innovation in a plant which does custom molding, and has nothing to sell but service.

The final touch to the efficiency of the organization is given by the excellent arrangements made for the comfort and the convenience of the operators. There is a lunch room at which meals can be had at cost, and the workers are socially organized as well.

The plant has its own water supply, from artesian weels on the property, and its own power house. Railway facilities consist in sidings served by the Lehigh Valley railway. Other railroads, as the Pennsylvania and Jersey Central are within short trucking distance.

Other Products

The recent decided slump in the market for radio molded products has of course affected this plant, but by no means to as great an extent as it appears to have affected others. The great diversity of the interests served by the Shaw Co. enables it to go on about its business about as usual, as new lines are opening up daily.

An excellent example of this is found in musical instruments. Where formerly individual pieces of banjos, guitars and similar stringed instruments were made of wood, fashioned by hand, they are now molded from plastics. The frets are a specific case. Music roll ends, parts for wind instruments, flutes, clarinets and similar objects can be molded. The fountain pen industry is just waking up the possibilities of molded seamless barrels and caps and the watch and clock-makers are investigating the possibility of molded cases for their products.

It's H-P-M for the HIGH PRESSURE jobs

In the PLASTICS INDUSTRY this includes Hydraulic Presses for—

Curing and molding all plastic materials in either hand molds or fixed dies. Sizes and types to economically fit all production requirements. Die Sinking and Hobbing.

Also Automatic Controls for timing any molding cycle; Hydraulic Pumps, Accumulators, Valves and Fittings.

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Semi-Automatic Molding Press
for
Bakelite
Condensite
Redmanol

And other Synthetic Resins and Similar Plastics, molded in Dies, or in Flat or laminated Sheets. Four sizes, 75, 96, 117 and 168 tons pressure. Will take molds up to 18"x26" for the larger size. Adjustable ejector bars on both head and platen; and quick drop attachment for lower ejectors. Pull-Back Cylinders, Slip Joint Steam Fittings, Operating Valves and Pressure Gauge. Also Plain Hot and Chilling Presses, Accumulators, Pumps, Etc.

Presses for Special Work made to order.

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TECHNICAL ABSTRACTS
AND PATENT REVIEW

RADIO OR TELEPHONE PLUG. Ray H. Mason, assignor to Stromberg-Carlson Telephone & Mfg. Co., U. S. Patent 1,575,496, March 3, 1926.

Main feature lies in the method of construction, and resides in the manner of mounting the binding posts as well as in the structure of the body portion of the plug whereby all strains are removed from the binding posts. An additional feature is the method of attaching the stay cord to the handle of the plug, whereby the two portions of the handle may be opened on the stay-cord as a hinge and permit easy removal of the plug assembly.

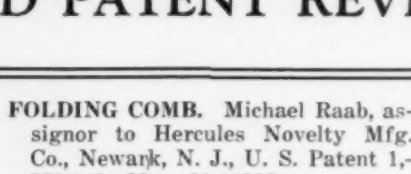
STABILIZATION OF CELLULOSE NITRATE FOR THE MANUFACTURE OF CELLULOID. G. Payras, Rev. gen. mat. plastiques, 1926, 2, 149.

A continuation of an article which deals with the theoretical considerations of the subject and which appeared in April, 1925. The present installment deals with the practical results obtained on large scale production. There are a large number of interesting tables and charts dealing with the influence of the time of boiling upon the stability, comparison between the effects of stabilizing in alkaline, acid, or in acid-alkaline and alkaline-acid combination treatments, composition of various cellulose nitrates, etc. This article should be of considerable value to manufacturers of celluloid and similar pyroxylin plastics. Its highly technical nature renders it unsuitable for reproduction in Plastics.

NOTES ON THE MANUFACTURE OF AND ON WORKING WITH "BAKELITES". Andre Ballandras, Rev. gen. matieres plastiques, 1926, 2, 98-99.

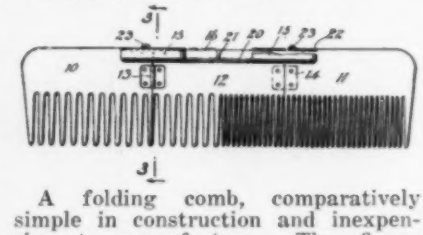
A condensed account of the various condensation products obtained when phenol and formaldehyde react under given conditions. Treats with (1) Product obtained when the mixture of phenol and aldehyde is rapidly heated at atmospheric pressure and under a reflux condenser; (2) heated to not over 65°C for a considerable time. Then goes into the question of molding, and deplores the absence of any molding powders in colors other than either brown and yellowish brown, and hopes that products producing blue, green, red, violet or white will be forthcoming. The small molder, that starts up and lasts but a few months, is seriously disturbing the French molding industry.

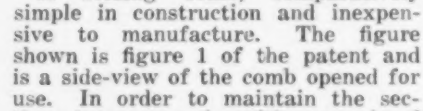
FOLDING COMB. Michael Raab, assignor to Hercules Novelty Mfg. Co., Newark, N. J., U. S. Patent 1,579,143; Mar. 30, 1926.

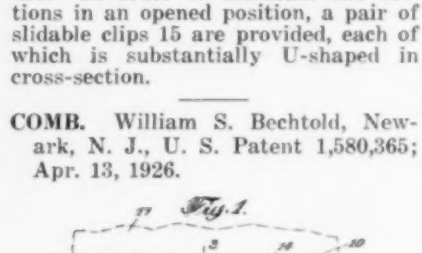


A folding comb, comparatively simple in construction and inexpensive to manufacture. The figure shown is figure 1 of the patent and is a side-view of the comb opened for use. In order to maintain the sections in an opened position, a pair of slidable clips 15 are provided, each of which is substantially U-shaped in cross-section.

COMB. William S. Bechtold, Newark, N. J., U. S. Patent 1,580,365; Apr. 13, 1926.







Inventor has found that combs having two rows of teeth staggered with respect to each other, and especially when the teeth of at least one row are curved, will be held firmly by short hair, and that a comb of such construction will be held firmly by short or bobbed hair. In the above drawings, Fig. 1 is a back view of one form of the comb, the continuation of the teeth shown being omitted. Fig. 2 is a section through line 2-2 of fig. 1, illustrating the staggered positions of the teeth of the two series or rows; Fig. 3 is a section through the lines 3-3 of fig. 1. Fig. 4 is a section through a modified form of the comb; Fig. 5 is a section through another modified form; Fig. 6 being a section through still a further modification.

CELLULOSE ESTER VARNISHES. L. Clement and C. Riviere, Rev. gen. mat. plastiques, 1926, 2, 175-179.

Practical commercial applications of the cellulose ester varnishes or lacquers, both for cellulose nitrate and cellulose acetate. An excellent account of the composition of these modern lacquers, the question of solvents and plasticizers, manufacturing methods and modes of application. The latter includes the preparation of transparent films, waterproofing of fabrics, lacquering metals and wood, and various decorative effects. States that in the United States in 1923 9 million liters (roughly 2.3 million gallons) had been made, while the American production for 1924 was was over 27 million liters.

CELLULOSE NITRATE COLLODIONS AND CELLULOID FILMS. Andre Breguet, Rev. gen. des materies plastiques, 1926, 2, 215.

Manufacture of film dopes is described in detail, touching also upon the stability of the cellulose nitrates, reasons for low stability, exterior causes of decomposition of celluloid and cellulose nitrate; a section on the role played by camphor in celluloid being also included.

THE SYNTHETIC RESINS. Andre Ballandras, Revue gen. mat. plastiques, 1926, 2, 226-229.

A general account of the phenol resins and a discussion of yields based on phenol consumption. Disputes the claims of certain manufacturers that they get 140% of resin based on phenol, and shows by equations that 6 mols. of phenol plus 7 mols. of formaldehyde yield, theoretically 118.085% of resin. Discusses the chemical properties and uses of what he called "the bakelites". Also gives a table of the resistance to acids, alkalies and water of various varnishes based on linseed oil, rubber, cellulose acetate, and the cresol and phenol resins. The latter show excellent resistance to immersion in water and acids, and cold alkalies, but suffer on immersion in hot (60°C) alkalies.

ANALYSIS OF CELLULOSE NITRATES. R. Gabillion, Revue Generale des matieres Plastiques, 1926, 2, 81-92.

A complete account of the various laboratory methods for the analysis of cellulose nitrates. Individual items covered are: color, limpidity of collodion prepared from it; moisture determination, nitrogen content, by the nitrometer, Dewarda method, Kjeldahl and others, solubility, viscosity, ash, calcium carbonate, acidity, chlorine, finess of subdivision, unnitrated cellulose, stability tests.

CELLULOSE NITRATE COMPOSITION. Stewart J. Carroll, assignor to Eastman Kodak Co., U. S. Patent 1,580,189, Apr. 13, 1926.

Film and celluloid-like compositions, free from bubbles, and having all the suppleness of compositions containing camphor are made by dissolving, for example, 100 parts of cellulose nitrate, from 20 to 50 (say 40) parts of butyl alcohol or fusel oil, 10 to 50 (say 20) parts of monochloronaphthalene in 300 to 450 parts of a volatile common solvent such as methyl alcohol or acetone, or a mixture of these solvents (say equal parts by weight of each). The monochloronaphthalene may be of the commercial type, the bulk boiling between 250 and 275 degrees C. (chiefly around 265°C.). In place of the monochloronaphthalene the translucent waxy tetrachloronaphthalene may be used. The use of camphor or the ordinary camphor substitutes such as mentioned in part 4, Vol. 1 of Worden's "Technology of Cellulose Esters" is disclaimed.

AMBER. Maurice de Keghel. Revue gen. des mat. plastiques. 1926, 2, 105.

A continuation of an article which began in the same journal in November 1925. This instalment deals with the color of fossil amber, milky amber, and finally with the molding of amber. The latter part of this article, dealing with molds and thermoplastic working of amber will appear in extenso in *Plastics* soon.

MAGNETIC SEPARATORS AND THEIR USE IN THE PLASTICS INDUSTRY. P. Saurel, from Arts et Metiers through Rev. gen. mat. plastiques, 1926, 2, 108-114

Gives a short account of the general conceptions of paramagnetic and diamagnetic materials, treated mathematically; and then describes various French types of magnetic separators, together with illustrations.

"PROGILITE", A NEW MOLDING POWDER. A. Helle-Staux, Rev. gen. mat. plastiques, 1926, 2, 129.

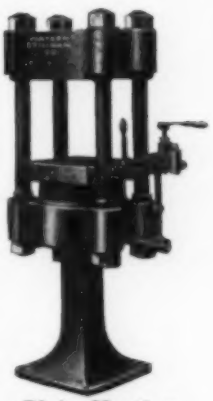
Said to be a perfectly odorless molding powder, the composition of which is not stated except that it is a material also used for making a pliable varnish; and that the base from which it is made polymerizes at 150°C.

CELLULOSE NITRATE COLLODIONS AND CELLULOID FILMS. A. Breguet, Rev. gen. mat. plastiques, 1926, 2, 297-302.

A continuation from an earlier issue. (vide supra). Deals with the viscosity of cellulose nitrate solutions; treatment before nitrating; effect of different conditions of nitrating upon the viscosity of resulting nitrate; washing and stabilization of the nitrate; bleaching; constitution. The nature of solvents and their effects on the cellulose esters is next taken up. The effects of time, action of heat, light and foreign substances is next discussed. The article contains 102 bibliographic references.

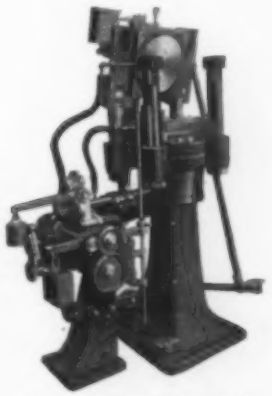
Hydraulic Presses

Especially designed for the molding of rubber, Gutta percha, celluloid, casein, bakelite, and other plastic materials.



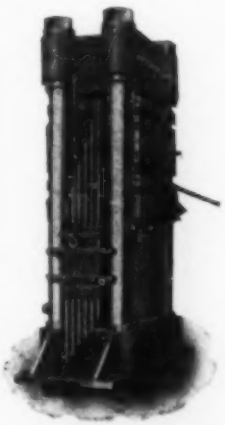
Plain Heating Press

We show here just a few examples from our large line. They are made in standard sizes from 10 to 1,800 tons capacity and the number of plates and size of openings can be made to suit conditions. The top platens can also be made adjustable to accommodate various heights, of dies, etc.



Semi Automatic Molding Press with Tilting Head

These Tilting head presses are practically automatic; the application of hydraulic pressure, duration of time of steam and cold water circulation through the dies being controlled by the valve mechanism. These automatic features do away with the human element in the timing of the heating and cooling of the dies, thereby insuring a uniformity as well as materially increasing production.



Multiple Plate Heating Press

We are prepared to furnish complete hydraulic installations, including pumps, accumulators, valves, fittings, etc. **Watson-Stillman presses are characterized by their strength and simplicity. Their rugged construction will stand up under most severe conditions.**

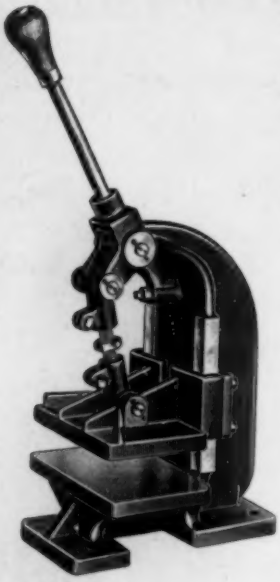
Write for catalogs.

THE WATSON-STILLMAN CO.

12 Carlisle St., NEW YORK CITY

Chicago Detroit **Cleveland Richmond** **St. Louis Philadelphia**

No. 1 Hand Lever Press



This Press has been especially designed for:

Light press or swedging.

Drawing and forming.

Inlaid work on celluloid articles.

Quick adjusting, and easily operated.

Specifications:

Stroke 2½"
Adjustment of Ram 1¼"
Maximum opening 4¾"
Minimum opening ½"
Size of table 9"x5½"
Weight 75 lbs., approximately.

We specialize in the manufacture of Machines, Tools, Dies and Molds for all kinds of Celluloid work.

Standard Tool Company, Leominster, Mass.

Highest Grade

CELLULOSE ACETATE

Stability.
Low acidity.
Clarity.
Uniformity.
Any desired viscosity.
Prompt Delivery.

Accurately controlled for definite solubility factors in various solvents, milled to a uniform bulk per weight and adjusted to obtain maximum solution in minimum time.

Made in U. S. A. Samples sent on request.

Sole Sales Agents

American-British Chemical Supplies, Inc.

Room 1505 *Telephone, Ashland 2266*

15 East 26th St. **New York**

Facts and Figures

(*Continued from page 310*)

Casein

Year	Production (lbs.)	Imports (lbs.)	Exports
1914	18,570,220	—	
1919	—NOT AVAILABLE—		NOT
1921			
1922	6,927,000	14,342,498	SEPARATELY
1923	14,548,000	26,489,992	
1924	20,760,000	17,749,985	LISTED.
1925	*12,996,000	18,803,816	

*First 9 months only.

tion are available. The figures are: 1914, 16,719,756 lbs.; 1919, 24,426,403 lbs.; 1921, 24,840,965 lbs.; 1923, 38,446,775 lbs.; 1924, 24,552,998 lbs. That such a large quantity should be dependent entirely upon importation is due to the fact that no shellac is produced in this country, and only substitutes are available.

The Associated Manufacturers of Electrical Supplies, Laminated Phenolic Products Section is responsible for the detailed compilation of statistics in this field for 1925 and the first two months of 1926. The production of laminated phenolic condensation products, sold mostly in the form of sheets, tubes, cut panels and gears, is as follows:

1925	
January	$880,318
February	558,184
March	490,169
April	366,761
May	416,741
June	481,664
July	527,052
August	883,158
September	1,096,531
October	1,318,083
November	984,598
December	681,050
Total	8,684,310
1926	
January	567,748
February	489,884

The most recent figures available, for the month of June, 1926, give the total "Domestic Exports of pyroxylin products from the United States," by individual countries. The totals are: In sheets, rods or tubes: 186,819 lbs, valued at $141,470. As manufactured articles, 181,105 lbs., with a value of $177,096. By far the greatest amount went to England, Australia and

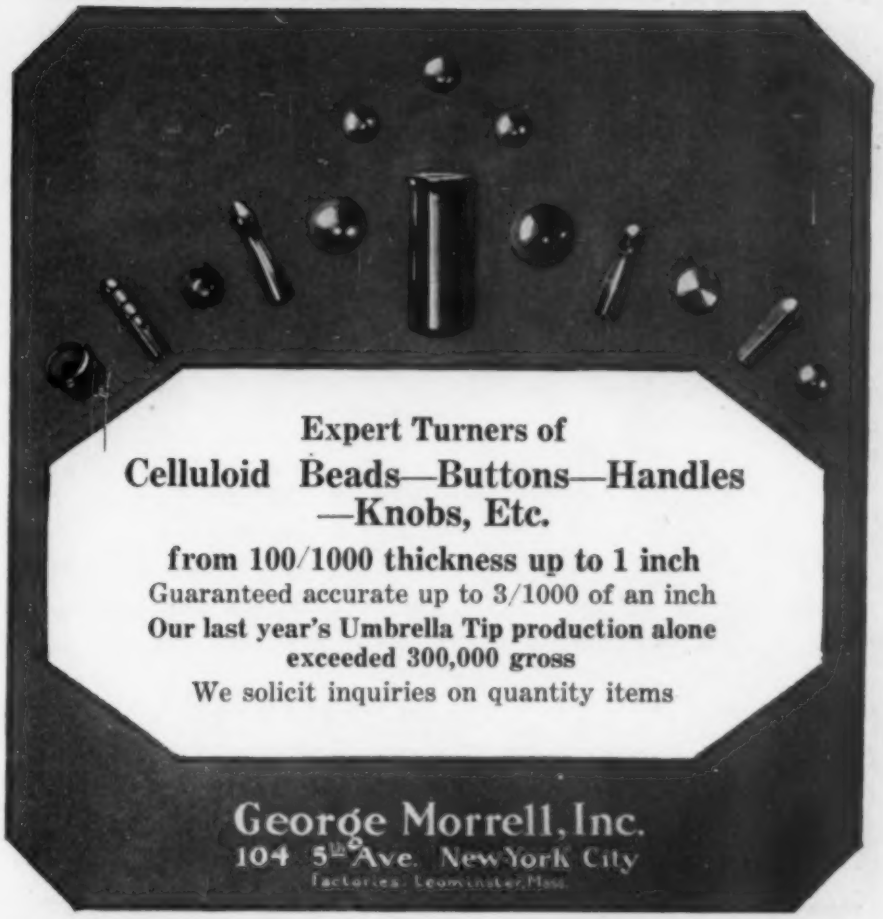
Canada, especially the latter. The figures for our northern neighbor are: Sheets, tubes and rods, 160,768 lbs., value $118,-544; manufactured articles 21,-850 lbs., value $31,124. From this it is quite plainly that Canada has quite an extensive fabricating industry. England, on the other hand, took only 10,663 lbs., value $9,085 worth of sheets, etc., against 140,473 lbs., value $123,311 worth of finished articles. Of the other countries, Argentina and Australia took the most. Germany and Austria took none at all.

The fluctuations in this trade are best seen from the detailed compilation for May:

DOMESTIC EXPORTS OF PYROXYLIN PRODUCTS FROM THE UNITED STATES, BY COUNTRIES.

Countries	In Sheets, Rods or Tubes		Manufactures of	
	Pounds	Dollars	Pounds	Dollars
Belgium	12,718	10,417		
Den. & Far. Islands	653	504	43	163
France	136	288		
Germany			46	55
Italy	36	75		
Guatemala	57	81	79	260
Netherlands			259	785
Sweden			35	98
United King.	179,866	155,937	1,567	1,255
Canada	193,028	146,988	39,290	29,986
Costa Rica			36	101
Honduras			37	116
Nicaragua			7	24
Panama			82	251
Salvador			80	385
Mexico	305	430	1,150	2,604
Newfld. & Lab.			77	214
Bermuda			10	50
Trin. & Tob.	16	10	10	16
Cuba	605	560	2,412	4,011
Dom. Repub.			32	19
Dutch W. In.			4	10
Argentina			1 620	1,148
Brazil	168	167	206	583
Colombia	52	68	14	43
Peru			176	1,500
Venezeuela	228	257	369	246
Aden			5	60
Br. India	77	86	30	131
Ceylon			13	12
China	63	86	6	20
Java & Mad.	165	120		
Japan, inc. Chos.	18,268	3,270		
Philippine Islands	420	434	398	538
Australia	5,953	4,827	7,974	7,658
New Z'land	884	681	70	135
Br. S. Afr.			69	478
Other Port. Afr.	5	10		
Total	413,703	325,246	56,204	52,955

Complete returns on the contest will be printed in the October issue.



Expert Turners of

Celluloid Beads—Buttons—Handles —Knobs, Etc.

from 100/1000 thickness up to 1 inch

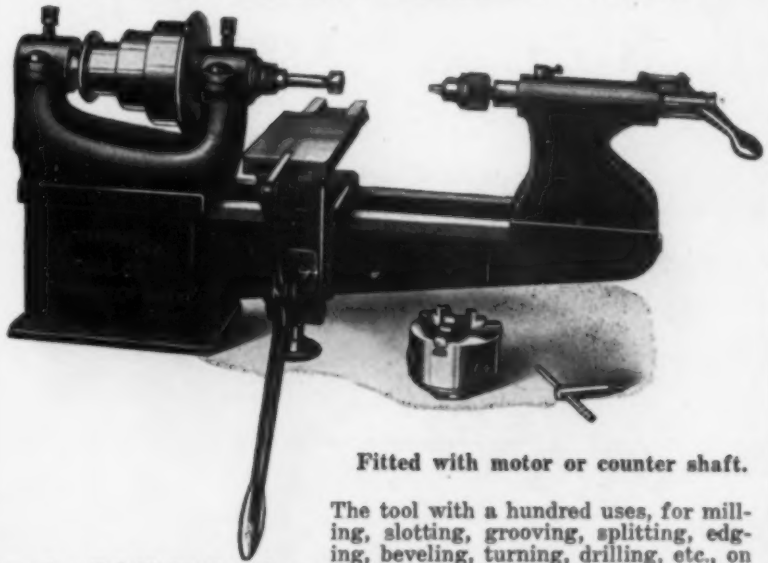
Guaranteed accurate up to 3/1000 of an inch

Our last year's Umbrella Tip production alone exceeded 300,000 gross

We solicit inquiries on quantity items

George Morrell, Inc.
104 5th Ave. New York City
Factories: Leominster, Mass.

THE PRECISION BENCH LATHE



Fitted with motor or counter shaft.

The tool with a hundred uses, for milling, slotting, grooving, splitting, edging, beveling, turning, drilling, etc., on wood, celluloid, hard rubber and metal.

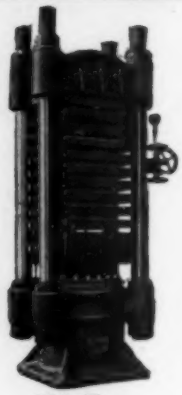
We manufacture other tools, beveling machines, rod-turning machines, bench drills, rubbing spindles, etc.

Have you tried our hardened beveling-burr and cutters? If not send for sample order.

We specialize in dies, machinery and tools for celluloid, hard rubber and metal.

LEOMINSTER TOOL COMPANY, Inc.,
LEOMINSTER, MASS.

QUALITY PRODUCTS
demand accurate, well built machinery
SOUTHWARK



900 Ton—
10 Opening
Steam Platen
Press

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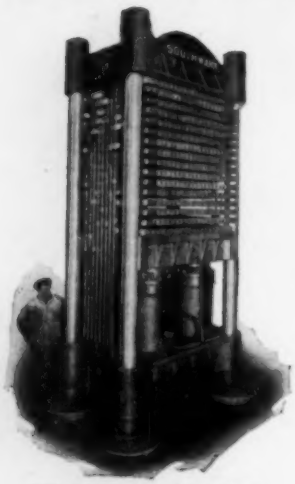
Largest Manufacturers
of Molded Goods
Hydraulic Pumps, Accumulators,
Valves, Fittings, Etc.



800 Ton—15 Opening
Steam Platen Press
4 Cylinders

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AKRON, O. CHICAGO, ILL.

Bleached Shellac
Special for Composition Makers
Refined Bleached Shellac
for
Lacquer Manufacturers

KASEBIER-CHATFIELD SHELLAC CO.
KASEBIER QUALITY GUARANTEED
EST. 1881
BLEACHED SHELLAC
KASEBIER QUALITY HAS EARNED ITS REPUTATION. THIS LOT WAS MADE WITH THE DETERMINATION TO KEEP IT
NEW YORK, N.Y.

KASEBIER-CHATFIELD SHELLAC COMPANY
7 CEDAR STREET NEW YORK

Another New Casein Plastic

The field of casein plastics has recently been entered by the Middlesex Aniline Co., located at Lincoln, N. J., near Bound Brook. They are now manufacturing an attractive line of casein solids, the output for the present being restricted to sheets only, although the production of rods and tubes is contemplated.

The material is sold under the registered trade mark of Tyrosite, and is being made, thus far, in black, gold, silver, white and tortoiseshell effects. Other colors and mottles will be added as production increases.

Tyrosite is made from imported casein, according to the latest improved methods. The sales end of the business is being handled by the Vice-President of the company, Mr. C. J. Redfern. A number of button manufacturers who are using the product have expressed very favorable opinions regarding its easy machining properties and the fine polish which can be imparted to it.

—o—

Covering Furniture With Pyroxylin

Now they are using thin sheets of pyroxylin for the covering of sanitary furniture.

A German patent (428099, to Celluloidwarenfabrik Dr. P. Hunnaeus) concerns itself with the use of celluloid sheets for the covering of upholstered furniture, the sheets recommended being 0.4 mm. in thickness and applied hermetically over a felt or similar base which in turn is used to cover the ordinary upholstery material. A sanitary and attractive, as well as resilient seat and back for chairs thus covered is assured. He also suggests that pillows can be made in the same way. Cellulose acetate sheeting is described as being an equivalent. Sponge rubber can also be used as a filler for such pillows or seats. Apparently here is a new outlet for the sheeting manufacturer.

will diminish the intensity of the glare of the approaching headlights. Perhaps a dark gray would be better than anything else, as it would not change the color of traffic lights—which is an important item. A red danger light looks green, or is entirely invisible, through a green shade.

Bending Pyroxylin Tubing

Recently the staff of the Gummi-Zeitung was asked for a good method for bending pyroxylin plastic tubing. Mr. A. Jaeckel answers this inquiry as follows (Gummi-Zeitung, 1926, Vol. 40, p. 2064):

"The pyroxylin plastic tubes must be softened in water before they are bent, and the tube should either be filled with sand, and stoppered at both ends to prevent the sand from falling out, or, still better, a solid soft rubber rod is drawn through the tube. If the tubes must be exactly of a certain diameter, the tube should be slightly smaller than this, heated up on a steel mandril under water, thus stretching it slightly, and the rubber rod then drawn into it. The exact shape is given to the tube by pressing against wooden forms, whereupon they are at once cooled in water so that they will retain their shape. For articles of other shape, conical or otherwise, a similar method is used. The material in excess is cut off while still in the hot water. If ornamentation is to be carried out on the article, this can also be done while the rubber rod is within the tube, but it is better to use a metal form for this purpose."

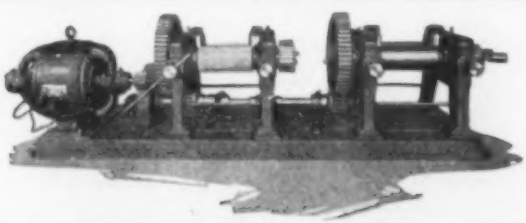
The Currie-Paxton Corporation, Hattiesburg, Miss., has acquired the plant and business of the F. K. Paxton Co., and contemplates expansion. The new organization will specialize in the production of steering wheels, running boards and other kindred equipment for automobiles. T. K. Currie is president.

E. W. WIGGINS
Office & Warehouse
LEOMINSTER, MASS.
Tel. 1451-W
Exclusive Sales Agent in New England Territory for

Nixon Nitration Works
NIXONOID
Pyroxylin
Sheets, Rods and Tubes

JOS. H. MEYER BROS.
Pearloid Sheets and Solutions
NACROLAQUE
The new non-inflammable pearloid sheeting in a variety of colors. For the novelty and toilet ware trade.

We build all our machinery from the drawing board to the finished product in our own plant. We also furnish standard and special gears for basic machinery and grind, polish and crown Mixing Mill, Refiner and Calender rolls. We are equipped to take care of you completely.
"MAY WE HAVE THE OPPORTUNITY?"
The Adamson Machine Company
AKRON, OHIO, U. S. A.
Engineers, Machinists, Iron and Steel Founders


Mixing Mills, Refiners and Washers
Mixing Machinery
The Banner Machine Co.
Columbiana and Akron, Ohio

Have You Heard of Compo - Black?

A base to add body and brilliancy to all Plastic compounds.

Write for Samples.

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Gum and Shellac Specialist.

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CELLULOID NOVELTIES

Celluloid Articles of All Descriptions

PEARL COATED in the most expert manner.

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814 Lexington Ave.
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Ground Pure Cotton

For use in all classes of Plastic Composition.

CLEANLINESS AND UNIFORMITY ASSURED

The Peckham Mfg. Co.
240 South Street
Newark, N. J.

USEFUL BOOKS

Plastics and Molded Electrical Insulation.

Emile Hemming. 313 pages. Illustrated. $5.00.

Very special care has been taken in the preparation of the chapter of molded insulation. Contains hundreds of references to plastic and composition products and their utilization.

Celluloid.

Its raw material, manufacture, properties and uses.

Dr. Fr. Bockmann. 188 pages. 69 illustrations. $3.50.

In this book, the raw product, cellulose and its properties are thoroughly described. Other raw materials and methods of rendering them more plastic also occupy attention.

Pyroxylin Enamels and Lacquers.

Samuel P. Wilson. 213 pages. Illustrated. $3.00.

An authorative work dealing with the materials and manufacture of pyroxylin solutions and with their application in the industry.

Cellulose Ester Varnishes.

F. Sproxton. 1925. $4.50.

An exceptionally well-written book on the general subject of the cellulose ester lacquers. Up-to-date and sufficiently non-technical to be of inestimable use to manufacturers.

Synthetic Resins and their Plastics.

Carleton Ellis. 514 pages; illustrated. $6.00.

The book will serve as a guide and prove a stimulus to the numerous investgiators and practitioners in the field of artificial resins. The section of plastic molding is especially valuable.

Any of the above can be obtained by writing to

Book Department
PLASTICS
461 4th Ave., New York

Every plant or fabricating establishment needs all the books on the subject of its manufacture that it can obtain. Remember "Knowledge is power."

Dyed Celluloid

(*Concluded from page 308*)

the application of the color, the articles are again subjected to pressure, usually much greater than during the first stages of manufacture. This will increase the density of the material and will at the same time cause the color to become firmly imbedded in the surface of the same so that permanent decorative effects are obtained.

The inventor claims that the colors and designs thus produced are as permanent as that of natural products.

Anti-glare Shields

The dark green pyroxylin plastic eye-shades that have proven such a boon to the manufacturers of plastic sheets now have a companion product that bids fair to consume an equally large amount of these green sheets. They are anti-glare devices for attaching to windshields.

While the idea is as old as the automobile, the shape of the present edition is so that it cuts off the rays only when it is desired to do so, the device being hinged so that it can be thrown up out of the way without detaching it from the windshield. Contact with the glass is maintained by two rubber suction discs. While originally sold on the street for one dollar, by one who was evidently the originator, they have now reached the ten-cent stores, and their sales should soon reach into the million.

Why Green?

Well, here is an object that can honestly be made to sell for a dime and may prove a profitable "filler" for an otherwise dull season. Why they should be limited to green, however, is beyond our understanding, as other shades would do as well; especially dark red, dark blue, purple and various shades of brown; anything in fact that

Loud Speaker Horns

One way of avoiding use of pressure molding methods

METHODS for the production of loud-speaker horns have not been published very widely, and it is perhaps interesting to a number of our readers to learn of at least one successful method, which of course is subject to a number of modifications. However, it is patented by A. E. Pollock and W. P. Horn, who obtained U. S. Patent 1,507,711 about two years ago on the process.

Ordinarily, plastic products of this kind are made over a mold, by laying wet paper or similar material over the mold, and it is then allowed to dry until the paper or fibre shrinks and becomes a solid mass, the form being then removed from the mold and ground on a grinding machine to remove bumps and roughness before a finish is applied.

The inventors simplify and improve the process by eliminating much of the hand work, and by constructing a horn which will be water and heat proof; and to greatly increase the speed at which such horns or other articles may be made, and at the same time result in a product which will be homogeneous and uniform thru-out.

Aluminum Molds

In constructing an article according to the process referred to, a mold of aluminum or other material is used.

This mold may be made in sections if necessary to permit it to be "drawn," but the details of its construction are immaterial. Upon this mold is pulled or drawn a sleeve or tubular article of flexible material, such as cloth. This material is preferably a woven fabric having sufficient stretch or elasticity so that when applied to the mold it will closely conform to and fit the surface thereof. Such a material as jersey cloth, woven felt, or underwear material has been found suitable for the purpose. These sleeves may be woven to a suitable shape, or may be cut from a pattern so that when sewn up will slide over the mold and fit the same perfectly.

The selection and preparation of the material referred to is a matter of considerable importance and in order to produce a horn of fine quality and full resonance it is necessary that the material be such that it will not absorb water and also that it be free from oil, either of which would make the horn spongy in spots or prevent the thoro impregnation of the material by the hardening substance used. Therefore, the material or fabric is treated so as to extract all the natural oils therefrom, this treatment being conveniently a chemical one such as by an oil solution which will produce the desired result.

Hardening

After the sleeve is drawn on the form it is hardened by impregnating the same with glue or paste or other hardening materials, and by reason of the nature and condition of the material used the glue or the like is absorbed to a full extent and impregnates all parts of the material. After being impregnated, the article on the mold is placed in an oven to hasten the drying at the end of which the sleeve becomes a hard and solid article, self-sustaining, and requiring but a small amount of hand work to finish the same. The surface is comparatively smooth and in good condition to take a finish.

Some articles may be built up of several sleeves, in order to produce additional thickness, one sleeve being impregnated and

(*Continued on page 330*)

Pyroxylin Plastics Waste

All Grades and Colors in Large Quantities

Browning Pyroxylin Products Corporation

Passaic & Hawthorne Avenues

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Specializing in tubes for Fountain Pens

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The Improved ARROW Routing Machine

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BOILERS

ALL KINDS ALL SIZES

Also Ideal Steam Generators Without Flues

WRITE FOR CATALOGUE AND PRICES

Syracuse Steam Generator, Inc., Syracuse, N. Y.

LABELS That STICK to celluloid and other pyroxylin plastics. All sizes—printed; unprinted, and die-cut. Send for Samples.

Economy Ticket & Label Co.
552 7th Ave., New York City

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BAKELITE MOULDER—With practical experience, to be foreman of plant in Western Massachusetts. Apply to Arthur D. Little, Inc., 30 Charles River Road, Cambridge, Mass.

TO RENT—Floor to rent in new two-story factory. Sprinklers, vault for celluloid; rent reasonable. Baff Mfg. Co., 15 Argyle Pl., N. Arlington, N. J.

Seamless Hollow Celluloid Balls

RECENTLY one of the associate editors of the Celluloid Industrie section of the German "Gummi Zeitung" commented upon a possible improved method of making celluloid balls.

The writer mentions a recent American method for the production of seamless metallic balls made from tubing or plates, taking his information from the German publication "Technischen Rundschau," No. 20, of May 19, 1926. According to this source, hollow metallic balls are made by first forcing the metal into a metallic mold forming a U-shaped piece. A second operation produces the hemispheres and a third unites these into an ovoid article, a fourth, a final operation rendering the seam invisible. The small hole still remaining is then closed by pressing the ball between two revloving plates which make the ball a little bit smaller and thus close up the hole.

Jaeckel suggests that a similar method would assuredly work well in fabricating seamless celluloid balls, pearls and the like, as many of the operations essential with metal would be unnecessary. The first operation in the case of celluloid would be the formation of the hemispheres; the formation of the ball and closing of the seams being probably also done in one operation. A final pressing, slightly diminishing the size of the ball, and thus sealing up the only remaining opening, should complete the object. He suggests that celluloid fabricators experiment a little with this method, as it appears to be promising.

Loud Speaker Horns

(*Continued from page 329*)

dried before the other is placed thereon and treated in a similar manner.

After being dried, the horn is trimmed while on the mold and the mold may then be removed from the inside and is ready for the finish.

The finish may be of any color desired, and is preferably a coating of water proof material, as pyroxylin. and may be applied by dipping the article in a bath of the material, or it may be painted on. The best results have been obtained by using a solution of cellulose material having the character of an enamel or lacquer, which is hard and water proof and which will give, or is capable of receiving, a high finish.

A horn or other article so constructed will be hard and resonant, and very effective for sound reproduction, especially as it will be free from all soft or spongy spots. The fabric being fully impregnated with the hardening substance, and being coated with an enamel or finish as described, will not absorb moisture and therefore will indefinitely retain its rigidity and its resonant quality. Speed in manufacture is obtained because of the fact that the material does not have to be built up or assembled piece by piece on a form, as in the old papier mache processes, but can be drawn on the form complete in one operation and the hardening material immediately applied and absorbed, and after a few hours of drying is ready for the finish.

Folmer-Graflex Corp.

The Folmer-Graflex Corporation, Rochester, N. Y., is being organized to take over the local plant and property of the Folmer-Century division of the Eastman Kodak Co. The new company will coninue the present line of camera manufacture, including scientific cameras. It is expected to begin operations early in June. William F. Folmer, heretofore in charge of the Folmer-Century and Schwing divisions of the Eastman company, is president.

Accessories
For Toilet Articles

The buyers of toilet accessories are a part of the Plastic Industry. This page is read by every toilet-ware manufacturer in the United States.

Advertising rates on request.

PLASTICS
461 Fourth Ave., N. Y. City

Some Recent Trade-Mark Applications

Ser. No. 22,155. Bakelite Corporation.

The word BAKELITE. For picture frames and chair seats and arms. Claims use since Dec. 15, 1914. Application filed Oct. 23, 1925.

Ser. No. 212,527. Bakelite Corporation.

The infinity sign trade mark. for loving-cup and rosaries made of condensation products of phenols and formaldehyde. Claim use since Dec. 1, 1924. Application filed Apr. 11, 1925.

Ser. No. 224,724. Rohm & Haas Co., Inc.

The word HEXOL. For synthetic resins which are synthetic organic products of a resinous nature possessing incidentally a solvent action on nitrocellulose. Claim use since Sept. 22, 1925. Application filed Dec. 15, 1925.

Ser. No. 224,726. Rohm & Haas Co., Inc.

The word CRYSTALITE. Synthetic resins per se or in solution or in mixture for filling materials. Claim use since about June 2, 1925. Application filed December 15, 1925.

Baking With "Bakelite"

Ser. No. 229,610. Armstrong Packing Co.

The word BAKELITE. For Cottonseed-oil shortening. Claim use since Feb. 26, 1926; application filed April 3, 1826. Apparently the word Bakelite is attractive to other manufacturers and they are attempting to use it for such products as are not already covered by applications of the Bakelite Corporation.

TASSI BROS. MIRRORS NEW YORK AND PARIS

Mirrors of the Better Kind for Fabricators of Celluloid Toiletware

We Specialize in French Mirror Plates

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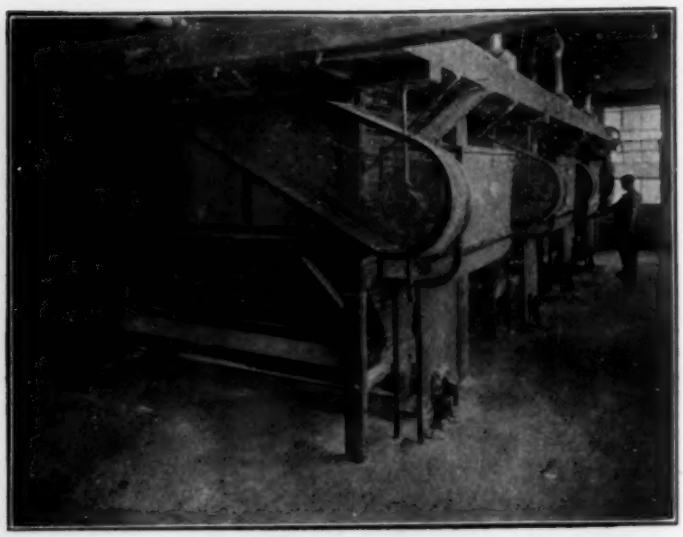
TOILET GOODS

A Monthly Magazine for Buyers of Toiletries and their Sales Clerks.

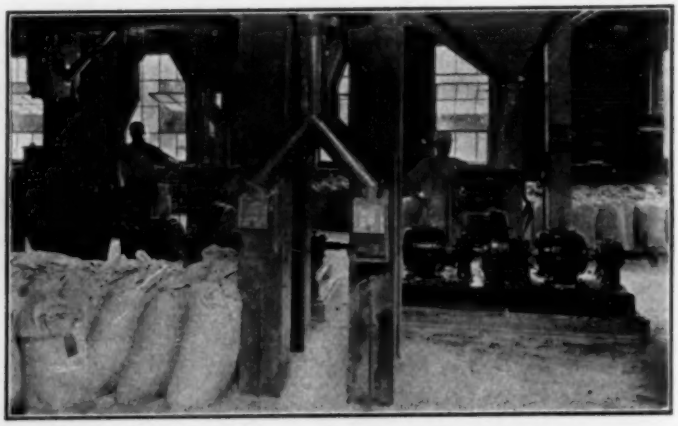
A sample copy of Toilet Goods and Circulation Analysis will be sent on request.

TOILET GOODS
18 W. 34 STREET
NEW YORK

Two Interesting Processes in Manufacture of Casein



A CASEIN SIFTER



PROCESS OF BAGGING CASEIN

Advertising in PLASTICS DIRECTORY

Index and Buyer's Guide

will have a permanent and lasting value to every buyer of your product in this industry.

Write for rates to

PLASTICS, 461 Fourth Ave., N. Y. City

PROPERTIES OF, AND ANALYSIS OF CELLULOSE ACETATE. Maurice Deschiens, Rev. gen. matieres plastiques, 1926, 2, 291-296. Chemical properties of various cellulose acetates; moisture content; solubility. Illustrated by graphs.

THE coloring of molded objects made from plastic materials, especially from casein, horn-flour or dust, hardened blood, disintegrated cellulose waste or powdered celluloid has been quite difficult due to the hardness of the surface and the lack of absorptive properties in the objects after molding.

Bruno Lauckner, of Harienburg, Germany, has recently (U. S. Patent 1,578,327 March 30, 1926) been granted protection for a method which makes it possible to produce colored or otherwise decorated objects from such waste.

The articles to be made from the material or substance such as powdered celluloid waste or casein or hardened bolld, are first molded or shaped preliminarily under a slight pressure, which is so chosen that the respective color or colors or lacquers, etc., can penetrate into the surface of the molded mass.

Durable Surface

The color or lacquer is then applied to the surface and permitted to penetrate the article to a certain depth, whereupon the article is subjected to a second pressing at much higher pressure. In this way the finished article has a durable colored or decorated surface.

—o—

New Showroom For Artcraft

The Artcraft Ivory Company, Inc., manufacturers of novelty manicure sets and powder boxes, have opened showrooms at 1123 Broadway, New York. C. H. Fischberg, secretary-treasuerer of the organization, is in charge.

Was Hoover Describing You ?

HOOVER SAYS U. S. TRAILS IN SCIENCE

Far Behind Europe in Advancing Fundamental Knowledge, He Tells Engineers Here

Secretary of Commerce Herbert Hoover yesterday lectured to the American Society of Mechanical Engineers here on the value of research in pure science.

It is all very well, he said, this glorifying of America in its progress in industrial science and the accompanying general industrial development, "unparalleled in history," but the backbone of this development, research in pure science, is weak.

"Instead of leading all other countries in the advancement of fundamental scientific knowledge," he declared, "the United States occupies a position far in the rear of the majority of European nations. A list of the awards of the Nobel prizes to men of various nationalities reveals the small proportion of first minds that we support."

—New York World Dec. 2, 1925

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